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INVESTIGATION TO STUDY THE AERODYNAMIC SHIP WAKE TURBULENCE GEN--ETC(U)

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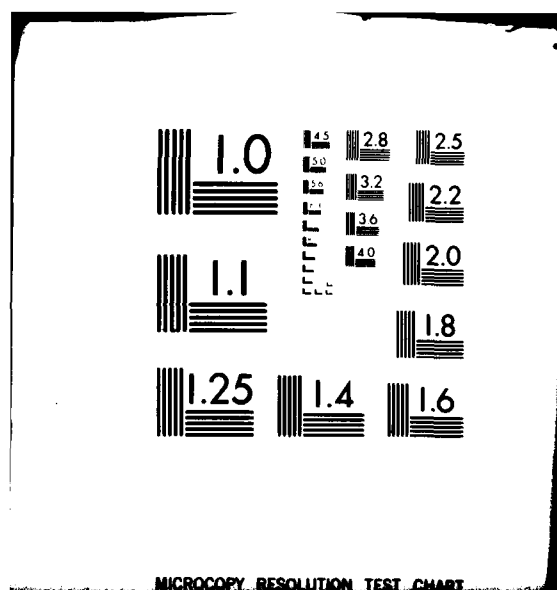
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4 April 1980  
8-1162-6192

Naval Air Development Center  
Warminster, Pennsylvania 18974

Attention: Code 6053

Subject: Contract N62269-78-C-0097, "Measurement of Velocity Components of the Air Wake of DD 963 Destroyer in Support of the Type (A) VSTOL" - Submittal of Final Report (Short Form)

Reference: (a) Naval Air Development Center Letter 84537 dated 18 January 1980, Same Subject

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Senior Contract Administrator

WJH:pb

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Contract No.  
N62269-78-C-0097

Investigation to Study the Aerodynamic  
Ship Wake Turbulence Generated  
by a DD963 Destroyer

Final Report  
for Period April 1978 through August 1979

NADC Report No. 77-214-30

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Warminster, Pennsylvania 18974

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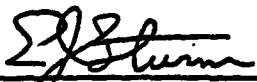
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24. ABSTRACT (Continue on reverse side if necessary and identify by block number) A wind tunnel program was accomplished in the Boeing Vertol Low Speed VSTOL facility to evaluate airwake turbulence behind the hull and superstructure of a 1/80 scale DD 963 destroyer model. Early flow visualization work employing smoke and helium/soap bubble techniques identified (and photographed) areas of major turbulence in the lee of prominent superstructure elements. Grids of hot wire anemometer probes were then used to			

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19. Key Words (Continued)

Landing Platform Bullseye  
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Frequency Analysis  
Bound Vortex  
Velocity Time History

20. Abstract (Continued)

quantitatively map three component velocity levels at selected locations above, behind, and on either side of the ship; for remote wind speeds of 20, 35 and 45 knots with ship yaw angles varied from 0° to 180°, and hull roll angle set at 0° and 15° right and left. Digital listings of mean and standard deviation velocity components were prepared from recorded time history tapes of the actual airwake turbulence. The principal application of these test results is expected to include synthesis of a Strouhal Scaled DD 963 airwake math model for helicopter and VSTOL flight simulation work, and formation of a data base for design of shipboard equipment to interface the vessel with its aircraft.

## PREFACE

This report presents a synopsis of testing accomplished in the Boeing Vertol VSTOL wind tunnel to map the turbulent aerodynamic wake behind a 1/80 scale U.S. Navy Spruance Class DD 963 Destroyer model. Grids of split-film/hot wire anemometer probes were used to measure turbulence levels at selected locations in the airwake, with the hull installed at various roll and yaw angles in the tunnel. Test results were computer processed to form three-component steady-state mean and dynamic velocity time history information for later application in the Navy VSTOL program.

The test was sponsored by the Naval Air Development Center, Warminster, Pa., and was performed by the Boeing Vertol Company, Philadelphia, Pa. under Contract N62269-78-C-0097. The U.S. Navy technical monitor for the program was Ronald Nave, Flight Dynamics Branch NADC - Code 6053. Boeing Vertol representatives included Theodore Garnett and Philip Sheridan of the Flying Qualities Staff, and Messers Franklin Devlin, David Hodder and Kenneth Farrance of the Wind Tunnel Staff. William Hackett, Dwayne Breger, James McLaughlin and Carl Robinson assisted in preparation of the Program Final Report.

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## SECTION 1.0 SUMMARY

### 1.1 BACKGROUND & OBJECTIVES

This report documents wind tunnel testing performed recently in the Boeing Vertol Low Speed Wind Tunnel, to map velocity components of the turbulent airwake behind a 1/80 scale DD 963 Spruance Class U.S. Navy Destroyer model. The report presents a synopsis of major test results, along with preliminary analysis of the more interesting flow phenomena observed as the test progressed.

During the period from 28 March through 6 April, 1979, a comprehensive flow visualization and air turbulence velocity component measurement program was conducted in the Vertol tunnel, to generate both quantitative and qualitative data for later application in Naval helicopter and VSTOL aircraft programs. The DD 963 test, sponsored by the Naval Air Development Center, Warminster, Pa., was similar in scope and technical content to one performed in 1976 by Boeing for the Naval Air Systems Command, with a 1/50 scale FF 1052 Frigate model (see Reference 1). Results of the earlier FF 1052 test have been used extensively in formulating math models of airwake turbulence created by the ship and its superstructure. It is expected that data from the DD 963 evaluation will be used in a similar manner, along with other wind tunnel results for the Spruance, acquired during Close-In airwake testing performed for the Naval Air Engineering Center, Lakehurst, N.J., described in Reference 12.

Broad interest in airwake models synthesized from test data produced by these two programs is anticipated, since the DD 963 is currently the smallest non-aviation type U.S. Navy ship planned for future VSTOL operations. The level of aerodynamic turbulence generated by the rather "bluff" shaped Spruance Class hull and superstructure will undoubtedly influence both the design of flight control systems for aircraft deployed aboard this vessel, and the overall configuration and function of specialized shipboard equipment installed for interfacing the 963 and its complement of helicopters and VSTOLS.

The principle objectives of the DD 963 test (BVWT 242/243) were to measure and record on magnetic tape three component (X,Y,Z) dynamic velocity time history data, at a sufficient number of locations above, beside, and behind the hull to identify areas of significant airflow disturbance (turbulence) which would influence VSTOL or helicopter operations aboard ship. To assist in this task, extensive flow visualization work was done at the start of the test (using smoke and helium/soap bubble techniques), to ensure proper positioning of hot wire anemometer equipment set up to measure the turbulence. Data reduction conducted at the end of the program produced digital listings of mean and standard deviation velocity information, along with digitized time history tapes.

Tunnel "remote-wind" velocities of 20, 35 and 45 knots were evaluated as the ship was yawed in 20° to 30° increments from 0° to 180° (in

both directions). Left and right yaw runs were necessitated because of an asymmetric superstructure configuration, resulting from placement of the forward and aft stacks on either side of the ship centerline. To complement data taken with the hull installed at 0° roll angle, testing was also accomplished with the ship rolled statically 15° right and left of vertical.

## 1.2 TEST EQUIPMENT & MODEL

Figure 1 illustrates the ship installation in the tunnel test section, elevated 14 inches above the tunnel floor (with its thick boundary layer) on a 20 by 20 foot square fixed "groundplane". As seen in the figure, the model was interfaced with the tunnel yaw drive system through a 2 inch thick solid wooden "adapter skirt", which provided the correct height relationship between the simulated "sea" surface (as represented by the groundplane with its own boundary layer) and the ship hull/superstructure combination. This adapter block, along with two others which permitted fixed 15° left or right roll angle mountings, ensured that elements of the ship above its waterline would extend above the groundplane boundary layer essentially the same scaled vertical distance as would similar elements on the full scale vessel at sea.

Selection of the vertical centerline of the main flight deck landing platform "bullseye" as the axis of yaw rotation for the model was made for several reasons. First, it was desirable to be able to place the anemometer probes as close to the landing pad as practical for efficient mapping of the airwake. Rotating the ship about the landing platform  $\zeta$  permitted installation of a concentrated cluster of probes behind the hangar, and these in turn were able to measure turbulence surrounding the approach and landing "area of interest" without requiring lateral movement as the ship was yawed.

A second reason for selecting the platform bullseye as the  $\zeta$  for yaw (instead of the ship center of gravity, for instance) was because this is the point on the ship from and to which the VSTOL aircraft or helicopter is always directed during launch and recovery operations. Flight simulation math models employing airwake data from tests of this type can take advantage of this fact, since at least some version of mathematical transformation is always required to compute spatial (and inertial) relationships between the aircraft and the landing/T.O. point on the ship. The airwake modeling task is facilitated somewhat by considering the landing bullseye as a point-source, about which the turbulence field generated by the ship is centered.

Accurate measurement of aerodynamic wake turbulence created by the hull and superstructure was accomplished with a grid of sensitive tri-axial "split-film" hot wire anemometer probes mounted on the movable rake shown in Figures 2, 3, and 4. Probe orientation on the rake was initially chosen to coincide with the predicted tracks of major shed vorticity behind various elements of ship superstructure. At the start of the test, "dummy" probes were placed on the rake in the

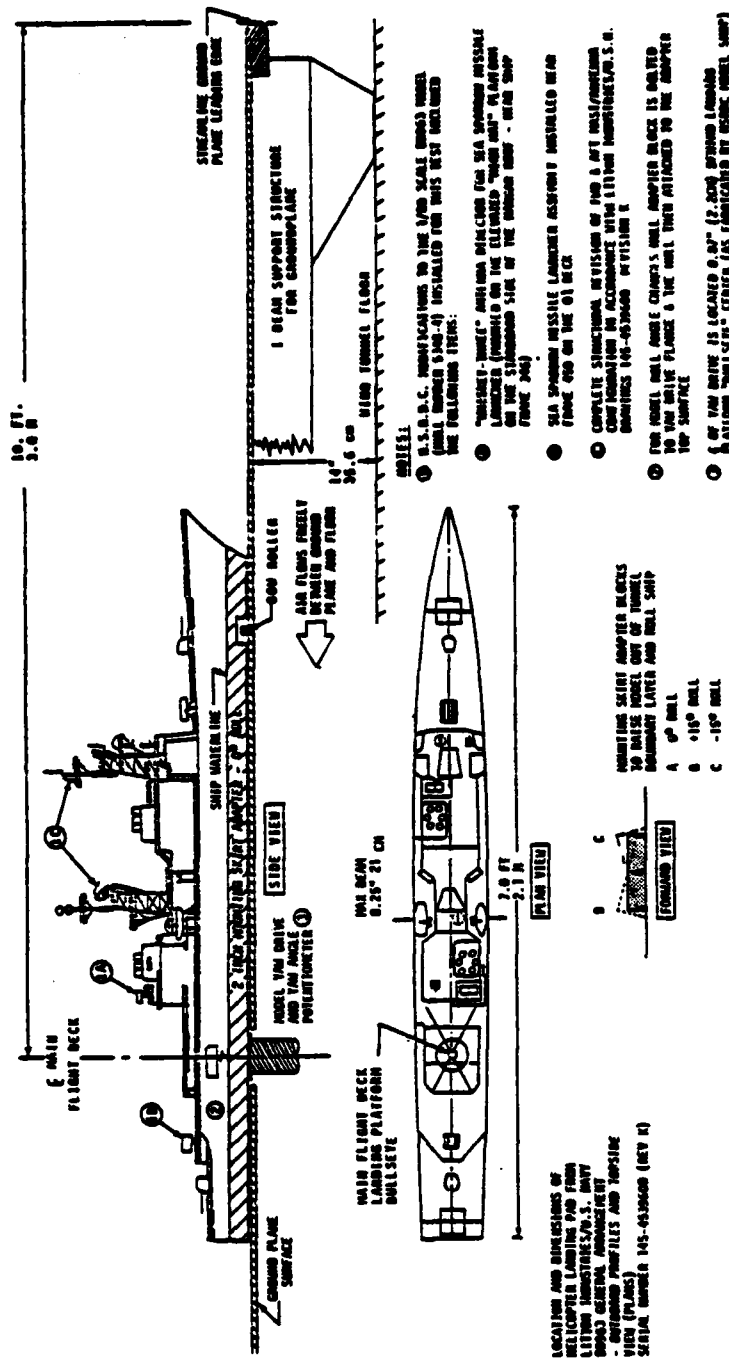
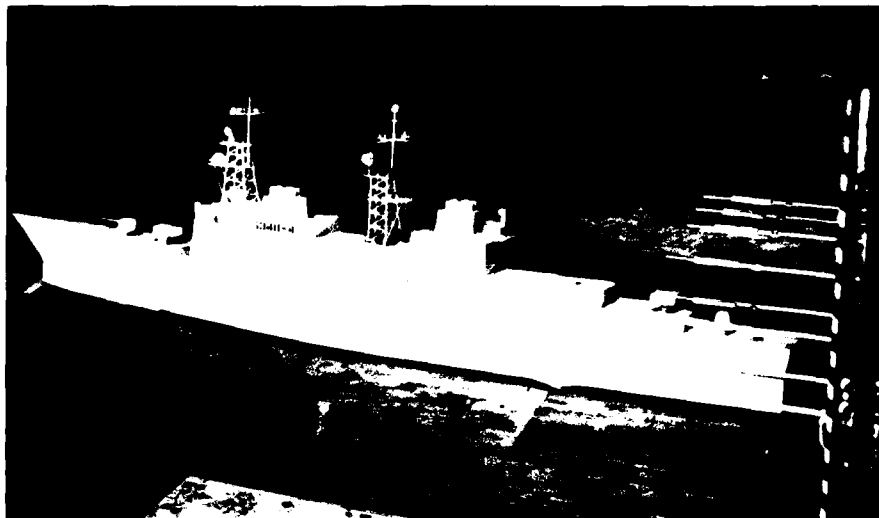
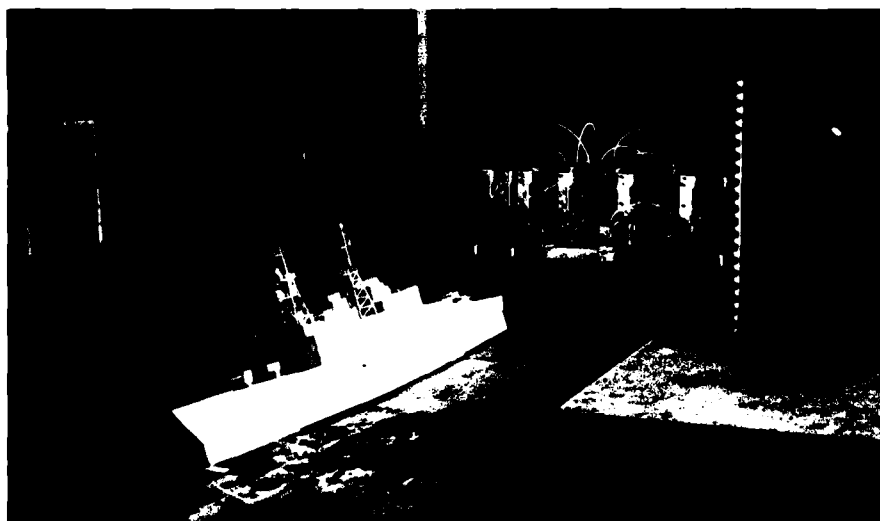


Figure 1. WIND TUNNEL SHIP GEOMETRY - 1/80 SCALE DD963  
SHOWING INSTALLATION IN TUNNEL SECTION

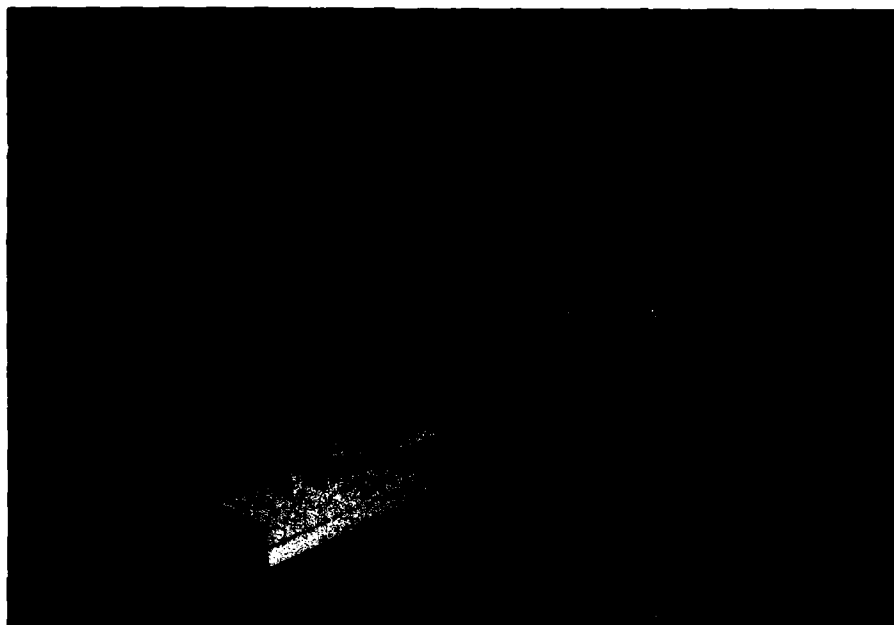


1/80 SCALE DD963 "WATERLINE" MODEL MOUNTED  
ON 2" HIGH ADAPTER SKIRT WITH PROBES  
INSTALLED ON RAKE BEHIND HULL



SHIP ROLLED 15° RIGHT - SHOWING RAKE WITH UPPER  
& LOWER ANEMOMETER ROWS ARRAYED FOR HEADWIND/  
CROSSWIND TESTING

Figure 2. DD963 DESTROYER AERODYNAMIC WAKE  
TURBULENCE TEST BVWT 242/243



"STERN-INTO-WIND" HULL ORIENTATION  
WITH PROBES MOUNTED VERTICALLY  
FOR "TAILWIND" TESTING

Figure 3.



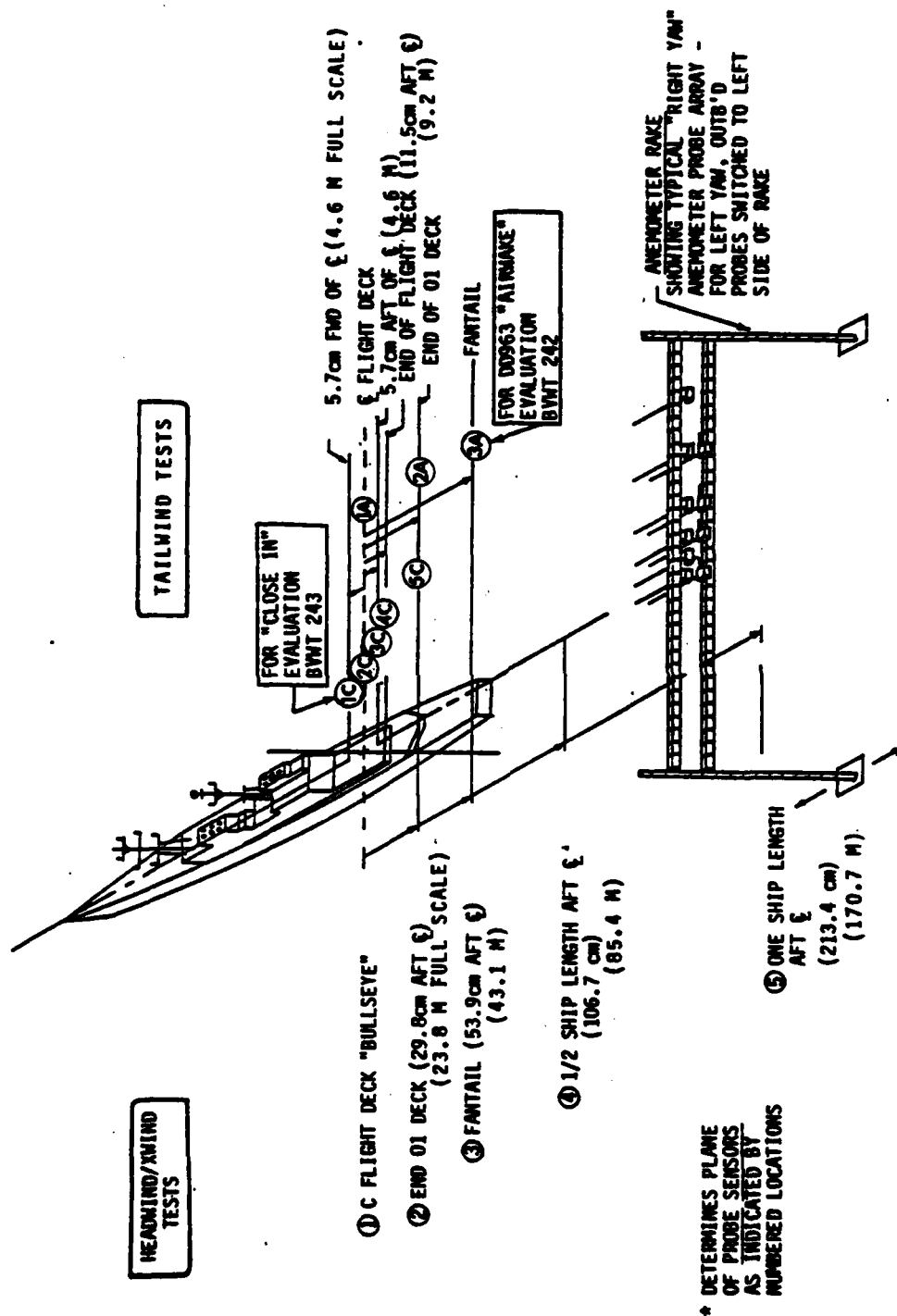


Figure 4. ANEMOMETER RAKE POSITIONING\*

locations of greatest predicted turbulence. Smoke flow visualization runs were then conducted to identify where the flow actually went as the ship was yawed from  $0^\circ$  to  $180^\circ$ . Observations from the side and above the model established final placement of probe arrays on the rake, and at what locations downwind of the landing platform the rake would have to be positioned to sample the airwake properly.

### 1.3 TEST PROCEDURE

Figures 4 and 5 illustrate normal anemometer rake positioning behind the hull at each of five downstream locations. The plane of the rake is oriented perpendicular to the tunnel flow and both side posts are bolted to the groundplane to provide rigidity. Probes were mounted parallel to the flow for headwind/crosswind runs (Figures 2 and 4). Vertical orientation was utilized for tailwind runs as shown in Figure 3, to prevent the probes from interfering aerodynamically with the flow, and to permit yawing the ship without having the anemometers become entangled in the superstructure.

Ten probes were active on the rake at any one time, and these were organized into two arrays; each consisting of a six probe upper horizontal row, and a four probe lower row. The array located nearest the height of the landing platform was referred to throughout the test as the lower array, and the other as the upper array. Probe positioning in the lower array located the bottom row of anemometers in a plane 3.2 m (2.54 M full scale) above the deck. This was the lowest height possible without hitting portions of the ship with the aft end of the anemometer-rake spreader hardware. Above this lowest level was a row of probes 6.22 M above the deck in the plane of the hangar roof, which was expected to shed major vorticity onto the landing area. Planes selected for upper array probe mounting included the exhaust gas stack uptake level (12.45 M high), and a plane passing through the largest radar antennas on both masts (located 18.03 M, full scale, above the deck).

Headwind/crosswind testing consisted of yawing the ship sequentially from  $0^\circ$  to  $30^\circ$ , then to  $50^\circ$ ,  $70^\circ$ ,  $90^\circ$ ,  $120^\circ$  and finally  $150^\circ$ . Maximum yaw angle at any rake location was dictated by how far the hull could be rotated before probe sensors hit the superstructure. After stabilizing tunnel speed at each yaw angle, one second of "quick-look" on-line data was taken for all probes simultaneously; and this information was then processed to form average  $V_x$ ,  $V_y$  and  $V_z$  velocities for validating proper probe operation. This "low-speed" data was followed by an 0.8 second burst of 164 sample/second "high-speed" information, intended for off-line processing into mean and standard deviation velocity components. The 0.8 second data sample is equivalent to 64 seconds in real time, when scaled up for the full size ship airwake, using Strouhal scaling laws described in Reference 2.

In addition to the 0.8 second runs normally accomplished for mapping the airwake, a very limited number of duplicate runs lasting about 10.5 seconds were also made, for application in analysis and math modeling dynamic components of the airwake at the end of the program.

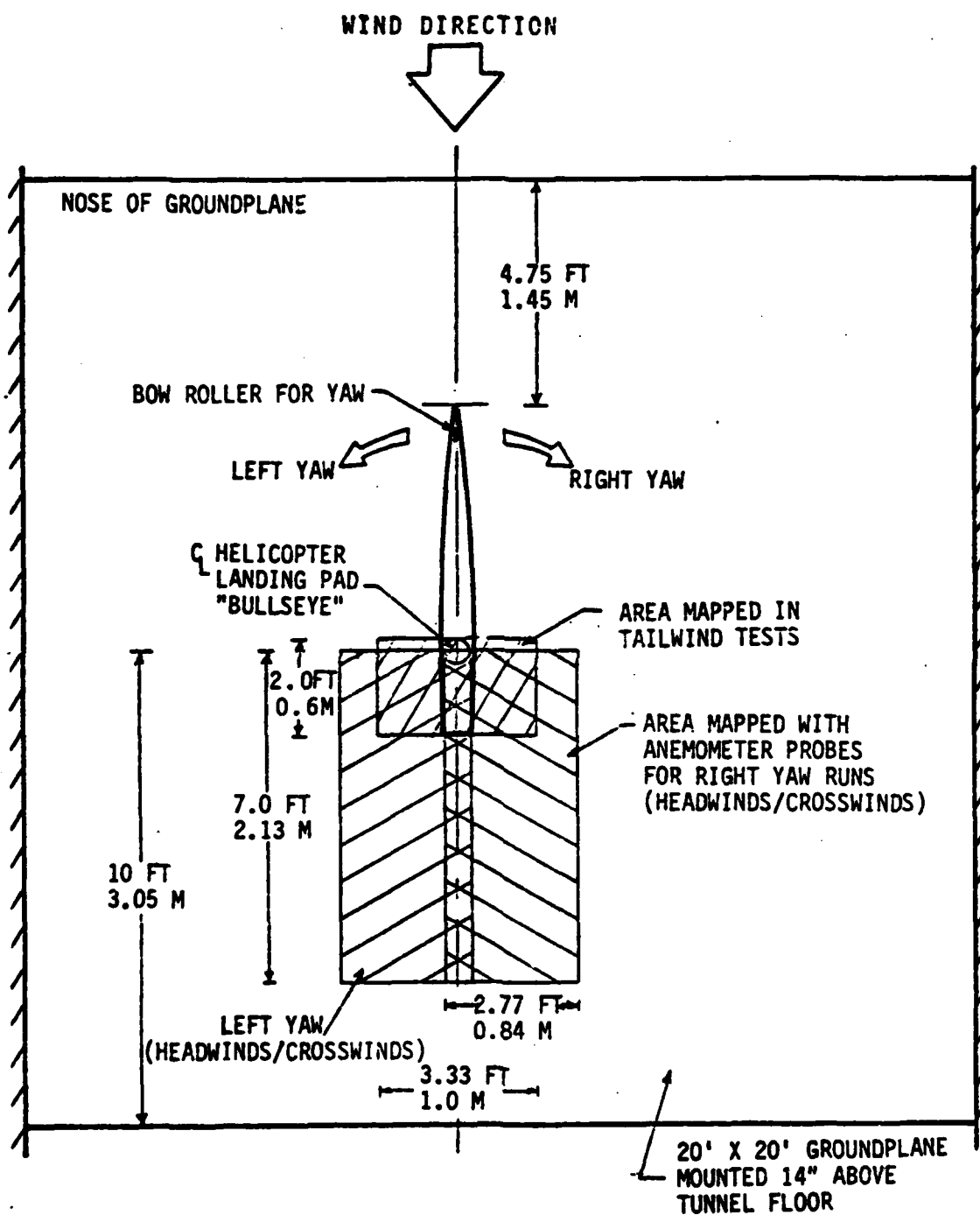


Figure 5. SHIP MODEL INSTALLATION AND AREA MAPPED FOR AIRWAKE TURBULENCE

Yaw sweeps were initially made to the right at 20 knots tunnel velocity, followed by runs at 35 and 45 knots. The 35 knot runs were eventually eliminated from the latter part of the test plan when it was confirmed (from plots of on-line data) that turbulence magnitudes were directly scalable with the free stream nominal wind speed. A similar result was found in the FF 1052 test data described in Reference 1. After finishing each data sweep at 45 knots, the rake was moved rearward to the next test location.

Initial velocity measurement runs were accomplished with probe sensors in the plane of the landing platform bullseye, and these were followed by repositioning the rake so as to locate sensors at the aft end of the "01" Deck. Upon completing data acquisition at all five downwind rake locations shown in Figure 4, the two row probe array was raised to the upper position and the data taking process repeated. Note that anemometer locations on the rake were bunched to the right of the ship centerline for the right yaw runs, and to the left when left yaw sweeps were made. With all right yaw test conditions completed, the 20/45 knot lower/upper probe array test variations were repeated in left yaw. Additional runs were accomplished with the hull rolled  $\pm 15^\circ$  either side of vertical.

Headwind/crosswind testing was followed by a series of 40 "tailwind" runs (200 data points) with the ship fantail headed into the wind (see Figures 3 and 4). Maximum yaw angles permissible for this evaluation (as limited by probe/superstructure interference), ended up truncating the desired data acquisition area by as much as  $30^\circ$  for some test conditions. In addition to this reduced yaw angle scope for tailwind testing, only one row of probes could be installed on the rake at a time (see Figure 3). Because of a limited amount of tunnel test time available, only three horizontal planes above the deck (instead of four) were evaluated during the tailwind phase of the program. Radar level testing was eliminated from the tailwind runs.

Considering all testing accomplished throughout the program, a total of 163 runs (with about 5 to 7 test points each) were made to acquire velocity data. In addition, 9 other runs were performed to qualitatively evaluate air flow patterns around the ship. These flow visualization runs employed smoke and soap bubble techniques to identify areas of separation and vorticity produced by the hull and superstructure. Because of the time required to install and remove flow viz equipment from the tunnel, the better part of two days were consumed in this phase of the test.

Including these flow "viz" yaw sweeps, a total of over 750 test points were taken during the program. An additional 270 points were acquired while performing a "Close-In" airwake evaluation (around the landing platform) for the Naval Air Engineering Center (NAEC), Lakehurst, N.J. Since this test was piggy-backed on the NADC program, certain elements of the two wind tunnel tests were combined to save time in the tunnel. These included the flow visualization runs made at the beginning and end of the program, and the tailwind evaluation. Test results from the Close-In study are summarized in Reference 12.

#### 1.4 TEST RESULTS

The principle results of the wake turbulence wind tunnel test include a series of three component velocity time histories recorded (in metric engineering units) on magnetic tape for every run, test point and probe. Also included is a computer printout listing with time history runs processed to derive steady-state Mean and 1 $\sigma$  Standard Deviation velocity components for all points (Appendix B includes this listing). Samples of the more interesting test results plotted from these two data sources are shown in Figures 6 through 12, which will be discussed later in the Summary.

Hot wire anemometer signal processing was accomplished throughout the test with a stand-alone electronic package supplied with each Thermo Systems Inc. probe, and signal conditioning network cards fabricated by the wind tunnel instrumentation staff to interface the processed signals with the wind tunnel IBM 1800 "WINDEE" data acquisition computer system. The anemometers generated six electronic signals (from three orthogonally oriented split-film sensors) which vary with wind velocity and direction. Using calibration constants derived by the probe manufacturer for individual probes, a proprietary computer program was used to convert raw sensor data to engineering units.

Further processing resolved the total measured velocity vector into X, Y, and Z components (with respect to the probe), and then corrected for probe mounting orientation to produce velocity information using the following wind-gust sign convention:

- Vx (+) in the downstream direction, parallel to the tunnel centerline
- Vy (+) to the left looking upwind in the tunnel, parallel to the groundplane
- and
- Vz (+) upward and perpendicular to the groundplane.

This velocity notation and sign convention was applied regardless of ship heading or probe orientation (for both the headwind/crosswind, and tailwind conditions). Using this axis system for velocity vector resolution (as opposed to some form of ship body axis, for instance), has the potential for simplifying flight simulation math modeling of the airwake if the wind turbulence is assumed to be aligned with the inertial earth axis, and is mapped with respect to the landing platform bullseye. Inertial location of the bullseye, of course, must consider ship motion when it is required in the flight simulation math model for launch and recovery operations.

#### TIME HISTORY SAMPLE

A typical time history representing the longitudinal Vx velocity component (for a single probe located to the side of the flight deck centerline) is depicted in the Figure 6 computer drawn plot. Data

VELOCITY TIME HISTORY  
 1X 15. TIME  
 RUN 9 TP 2

LEGEND  
 LM 4 PROBE 4

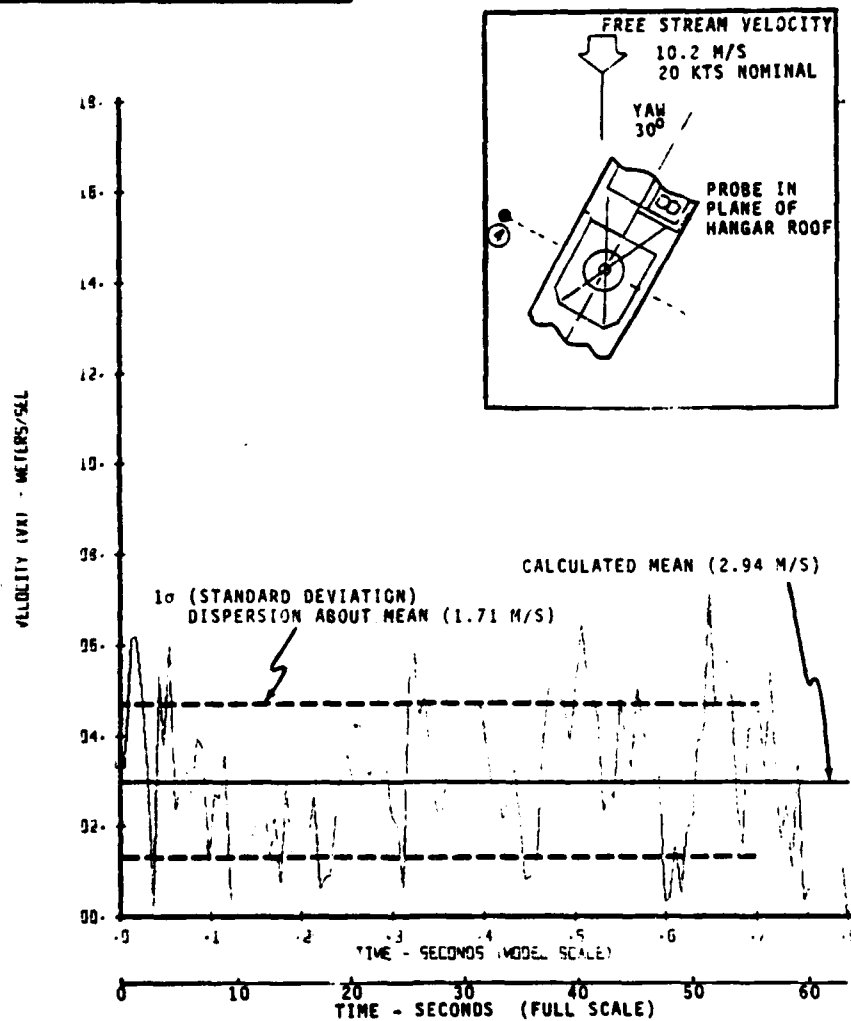


Figure 6. TYPICAL VELOCITY TIME HISTORY

used to generate this curve was sampled 131 times during the 0.8 second run (at a sample rate of 164 samples per second - the rate used for all data runs in the test). This sample rate was selected principally on the basis of scaling data results generated during the earlier FF 1052 testing. It represents a compromise between the data acquisition rate capability of the Wind Tunnel WINDEE System, and the amount of data thought to be practical and cost effective to analyze. Other factors influencing the sample rate chosen were the number of sensor signals to be processed and the desired frequency range of the scaled up results.

The test setup permitted accurate measurement of turbulence with a frequency content ranging between 1.25 Hz and 80 Hz model scale (assuming 2 samples per cycle are adequate to define the Fourier coefficients at the highest frequency desired). Sampling the signal at twice the expected maximum frequency present in the turbulence data was attempted, in order to prevent frequency-folding and data aliasing problems of the type described in Reference 3.

Based upon assumed Strouhal Number similarity between model and full scale data, where

$$S = \frac{fh}{v} ; \text{ with } S = \text{Strouhal number (usually constant for a given body shape)}$$

$f$  = frequency of the shed vorticity  
 $h$  = characteristic body dimension (usually width)  
 $v$  = flow velocity,

frequencies can be converted to full scale by simply dividing by the (80:1) model scale factor. Full scale frequency range capability for the test results is therefore on the order of 0.016 Hz to 1.0 Hz, which is more than adequate for application in existing VSTOL and helicopter simulation math models. Scaling the recorded time history data requires only a simple expansion of the time between data samples from 0.006 seconds (the recorded  $\Delta t$ ), to 0.49 seconds as shown at the bottom of Figure 6.

In addition to the time history trace shown in Figure 6, also illustrated are the calculated Mean and Standard Deviation values for the particular test point. It is interesting to note that the mean velocity for the run is less than 1/3 of the 20 knot (10.3 MPS) free stream flow, because of turbulent separation existing at the probe location (off to the side of the hangar roof corner). One sigma standard deviation about this mean is approximately 58 percent of the average steady-state velocity level, indicating a high level of roughness in the flow. This roughness was observed to grow significantly as the ship yaw angle was increased relative to the remote wind.

#### AIRWAKE VELOCITY MAPPING

Figures 7 through 12 present samples of the more interesting flow field characteristics measured in horizontal and vertical planes

behind the ship and its superstructure. Some of the information illustrated in these plots was observed qualitatively during flow visualization testing conducted before velocity measurement. One factor which stood out in the DD 963 flow "viz" work was that turbulence around the hull (at 0° yaw) was quite similar to that observed with the FF 1052.

Located behind the Spruance hangar is a powerful bound vortex which reduces local "q"\* substantially, (just as it did on the 1052). Results of this flow separation in the lee of the hangar are clearly visible, especially for the center three probes depicted in the Figure 7 horizontal velocity vector map. As seen in this plot, very little flow recovery occurs over the landing platform; and not until the aft end of the 01 deck is reached, does the flow along the ship centerline begin its recovery to normal free stream levels. The adverse impact of this aerodynamic "q-hole" effect on flight operations in the vicinity of the landing deck is obvious.

As the ship is yawed left or right 30° or so (Figures 8 and 9), the hull and superstructure tend to function as if they were, in fact, a very low aspect ratio wing tip sticking vertically out of the ground-plane and shedding a large powerful vortex into the flow field (which then corkscrews around like the tip vortices of a jumbo jet with flaps deployed). When the hull is yawed more than about 15°, the landing deck bound vortex described above disappears completely.

Skewing of the flow field due to twisting of the vortex sheet is obvious in the Figure 8 and 9 velocity vector plots, which represent, respectively, 20 knot and 45 knot data runs. Note that magnitude and direction of the steady field can be scaled by the remote wind velocity as mentioned earlier. As will be shown later in the report, frequency content also changes with remote windspeed variation, in apparent agreement with expected Strouhal scaling law fundamentals.

Figure 10 shows how the horizontal flow field typically skews around in a clockwise direction, as altitude is increased above the deck for a series of duplicate 30° left yaw runs. When the ship is yawed right, skewing of the field with altitude switches to a counterclockwise orientation. Velocity vector changes with height above the deck are also quite pronounced in vertical planes above the ship, as is shown in Figure 11, which depicts a 30° right yaw hull orientation. Somewhere above 30° (and below 50°) yaw, the wing-like hull appears to "stall", and very deep levels of flow separation are seen in both the flow visualization runs and plotted velocity vector charts. This interesting aerodynamic characteristic is treated in some depth later in the report.

Figure 12 is presented to give an indication of horizontal flow roughness, as depicted by 1σ standard deviation velocity variation about the mean resultant vector (with the ship yawed 30° to the remote wind).

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\*  $q = 1/2 \rho V^2$  = dynamic pressure  
where  $\rho$  = air density;  $V$  = velocity



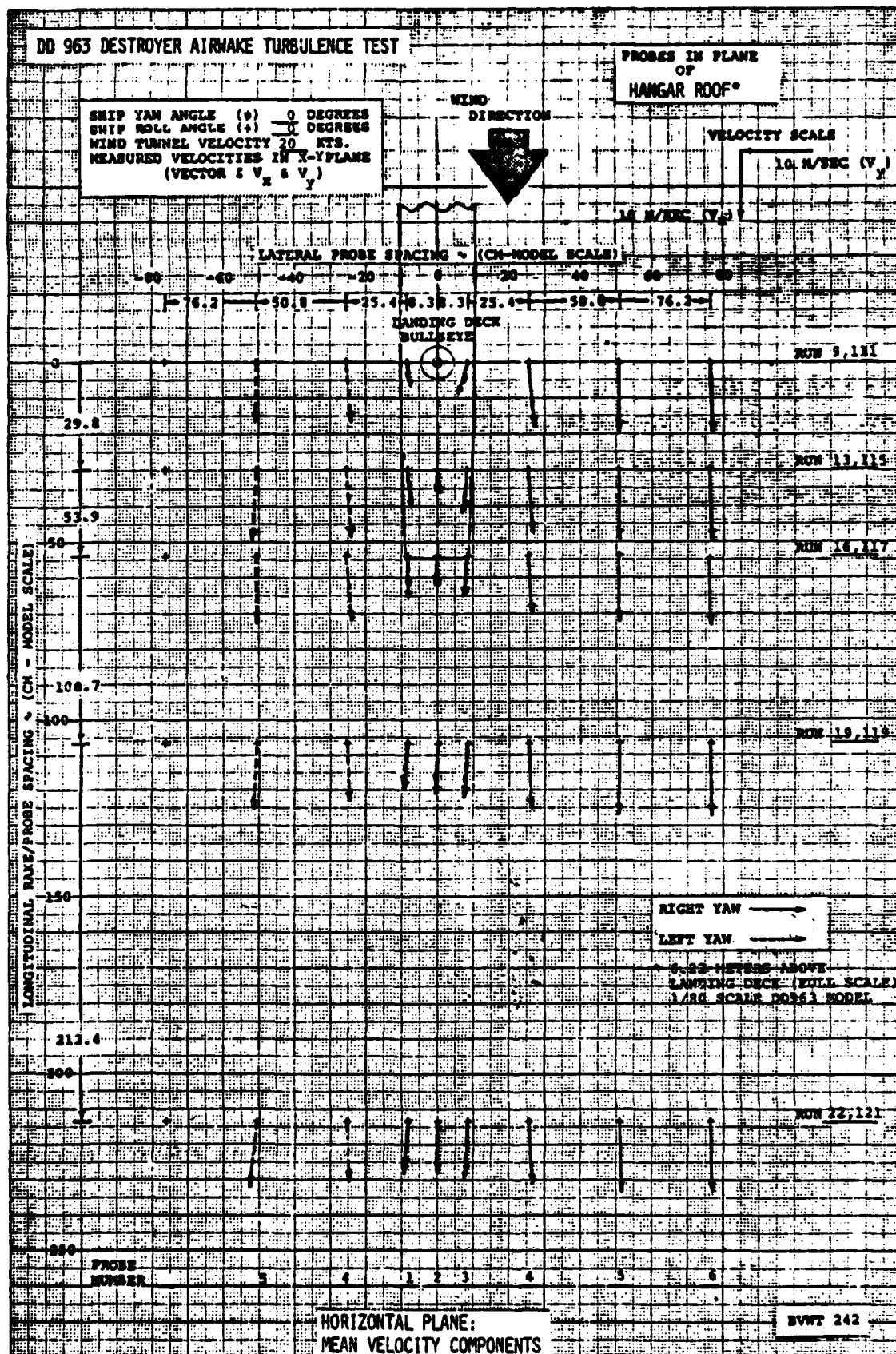
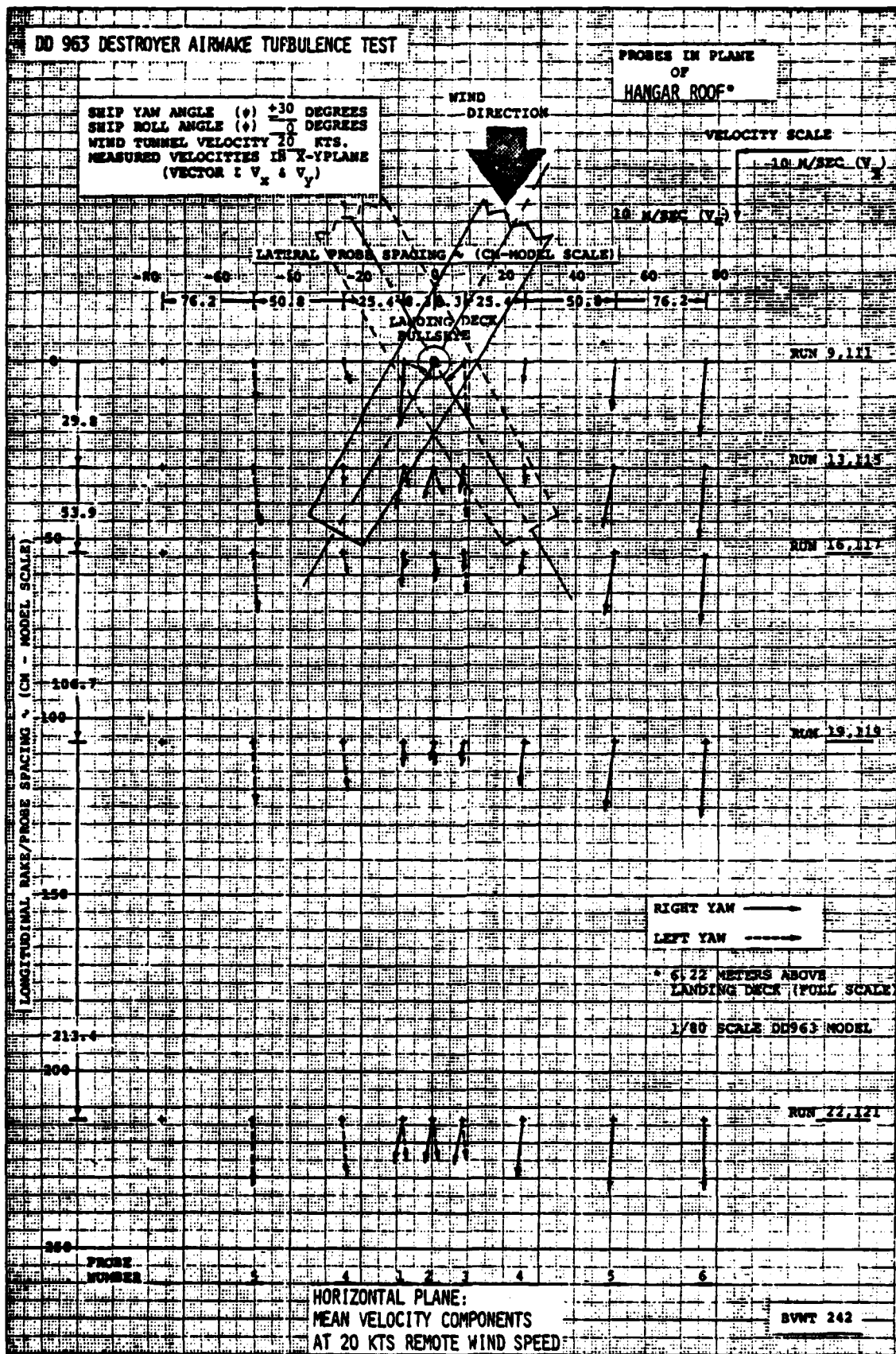


Figure 7.



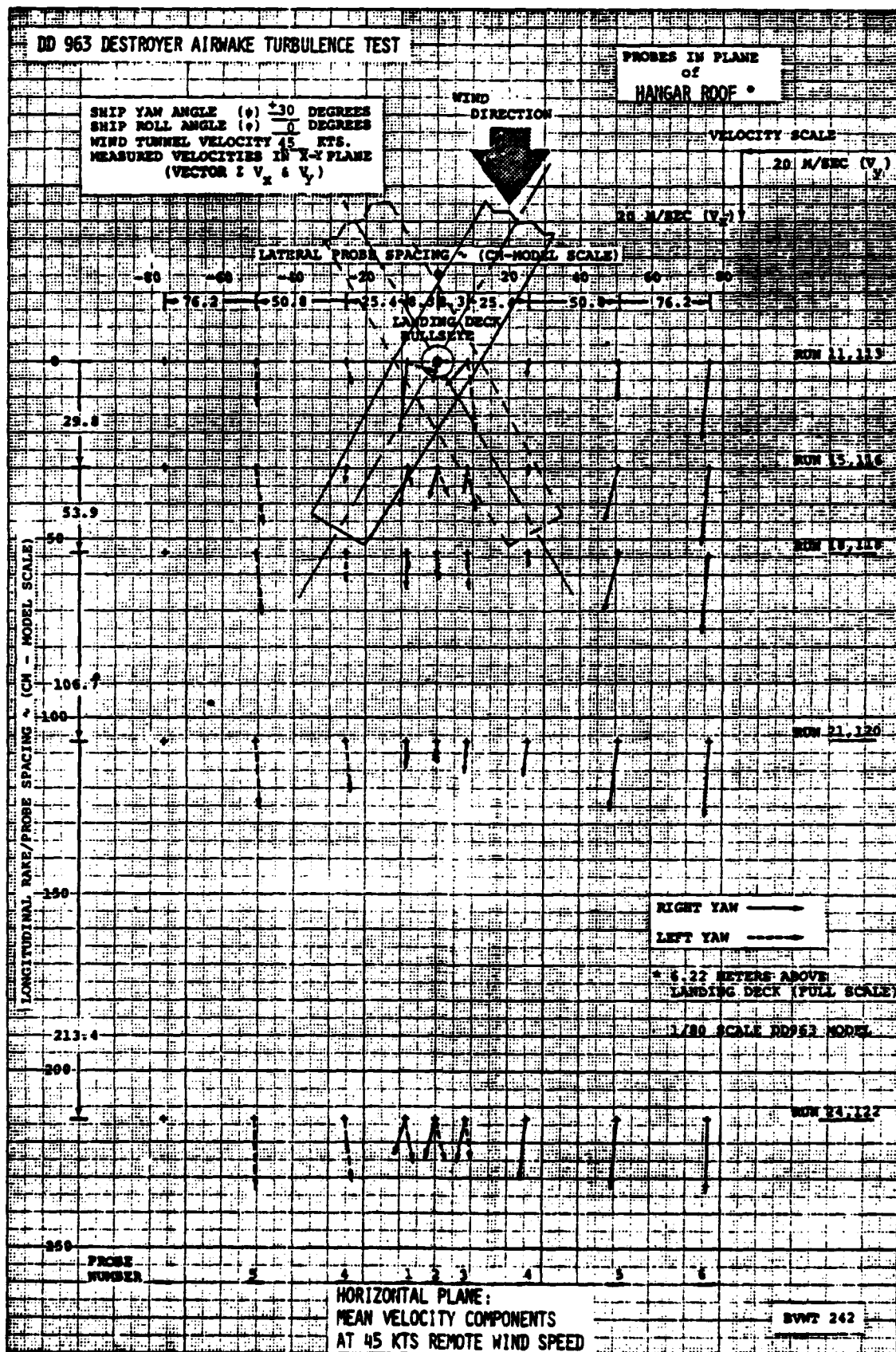


Figure 9.

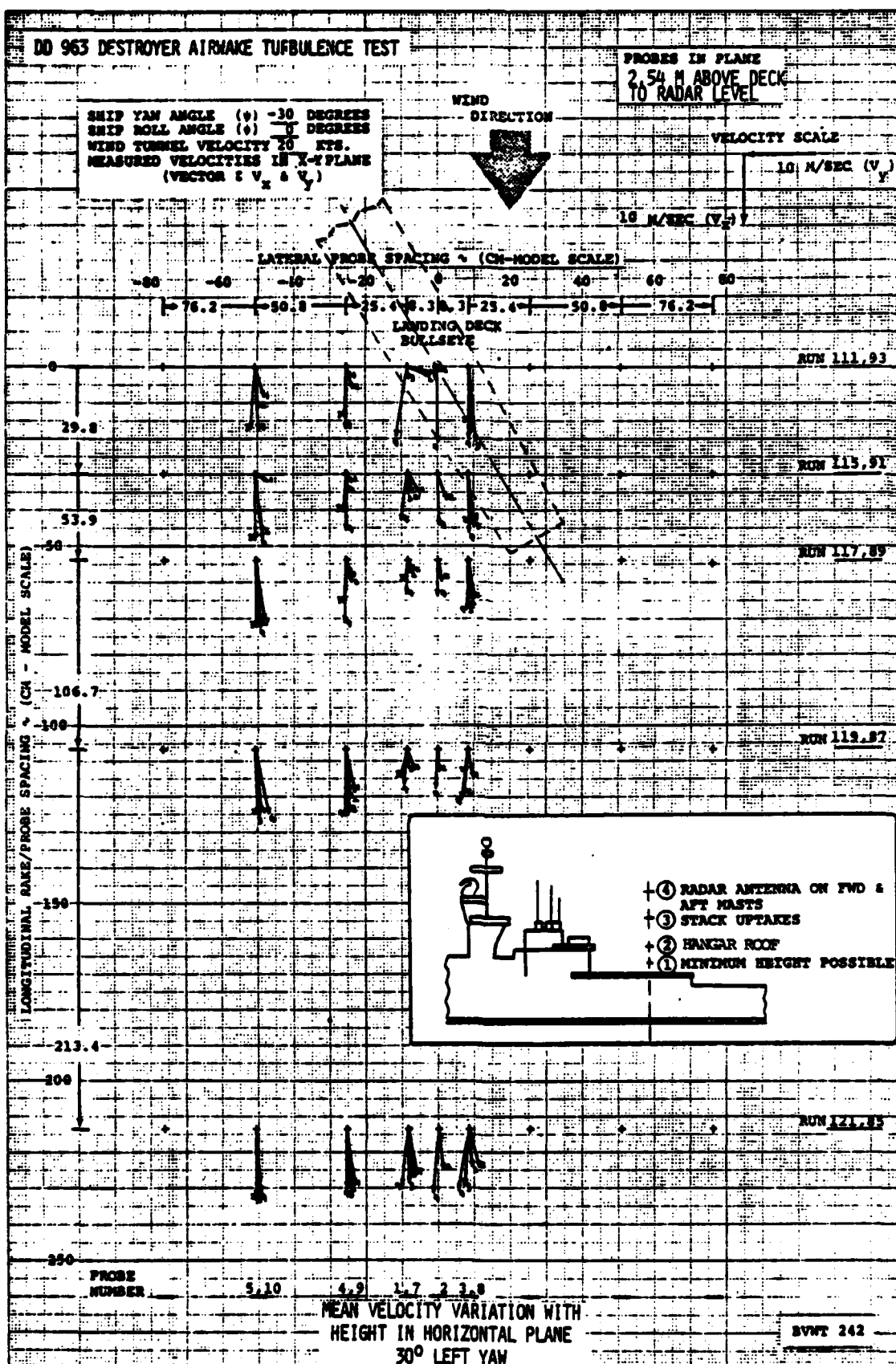


Figure 10.  
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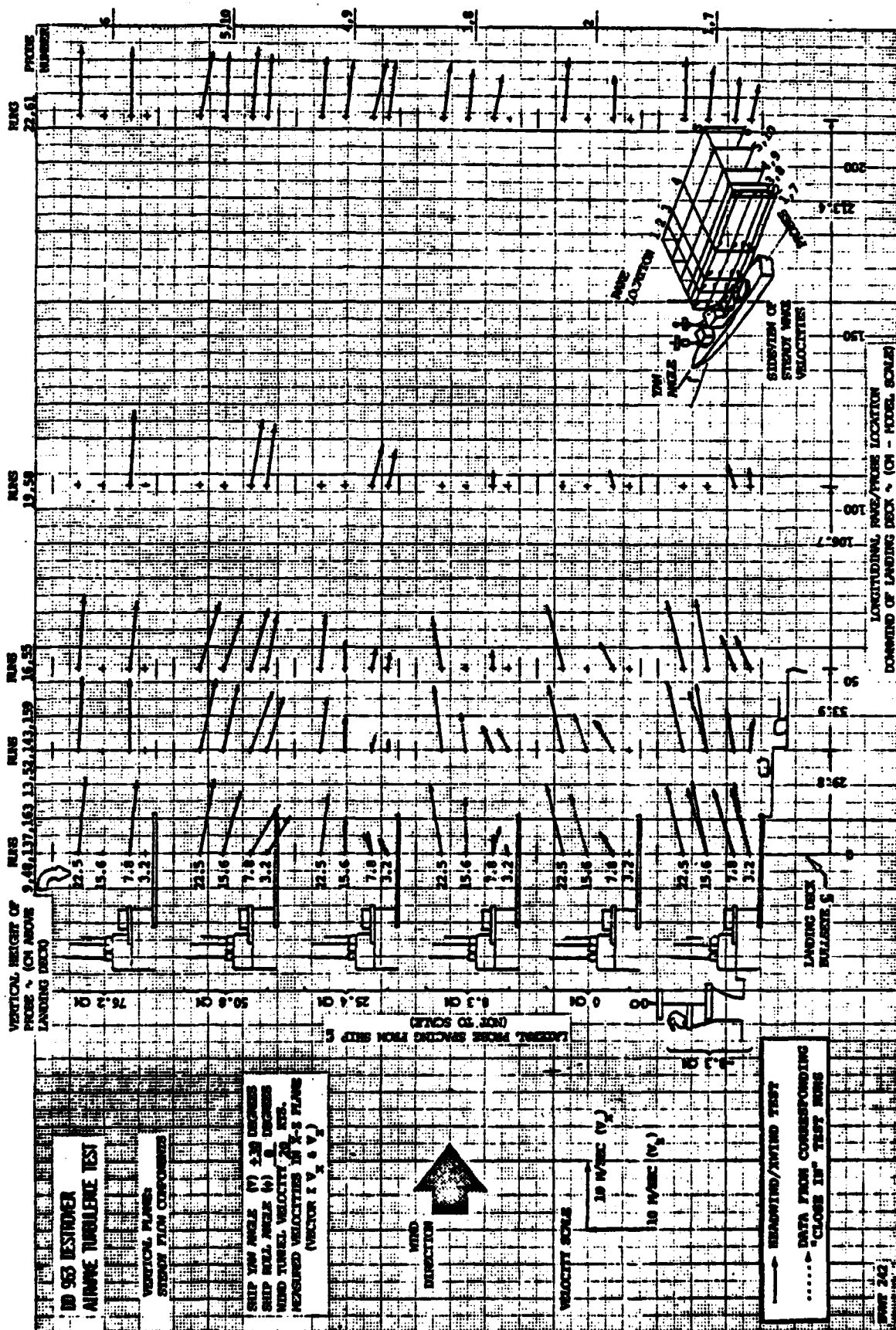


Figure 11.



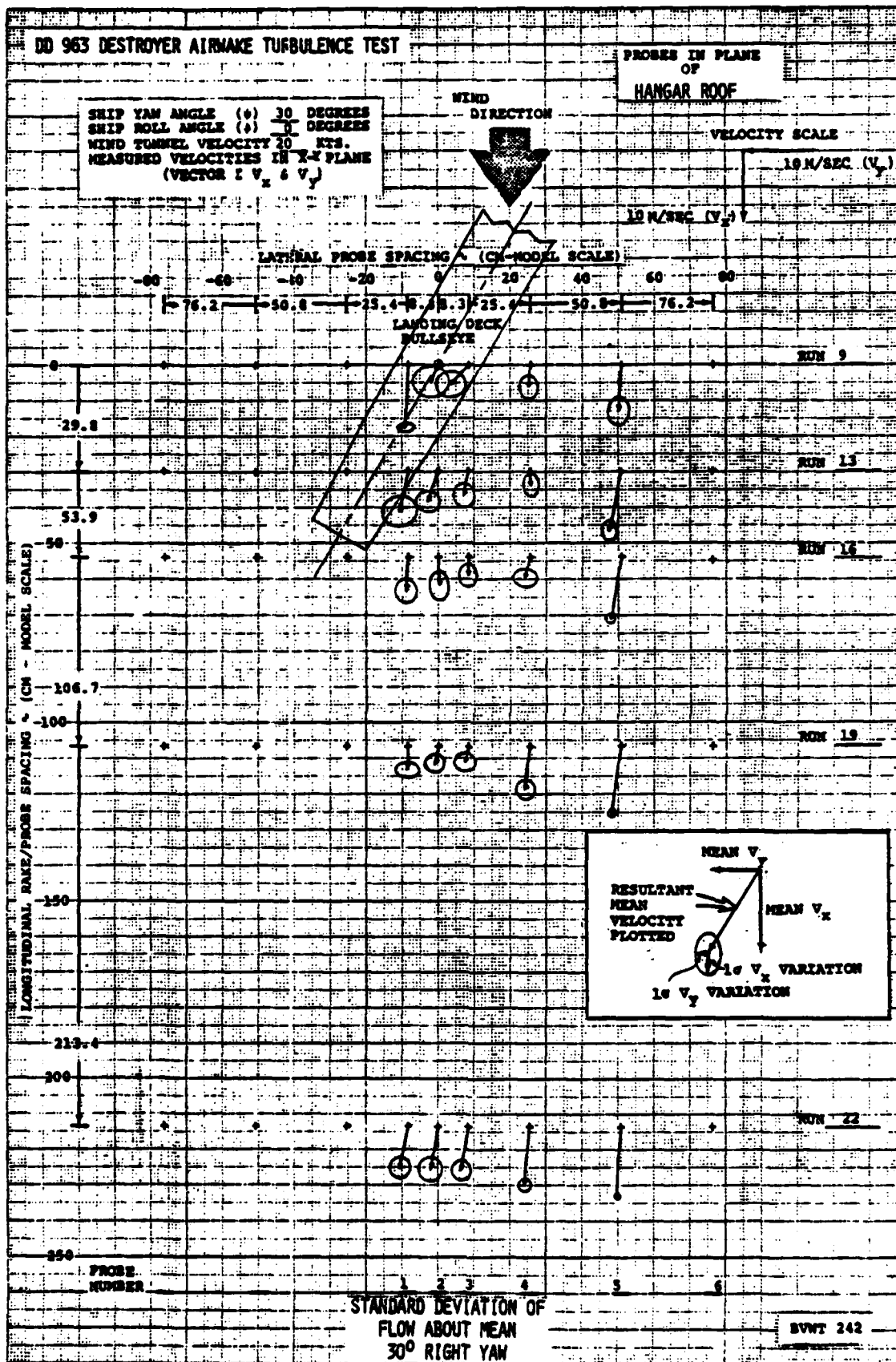


Figure 12.

Note how the  $l_0$  ellipse increases in size as the probes are moved closer to the back of the hangar. Also interesting to observe is the very large distance behind the ship over which flow is disturbed. Along the deck centerline track, flow has recovered less than 50% of remote speed at one full hull length aft of the landing platform.

#### 1.5 POTENTIAL APPLICATION OF TEST RESULTS

Currently, two approaches toward using the DD 963 wind tunnel turbulence data for future flight simulation math model and VSTOL or helicopter design work appear viable. The first involves application of the steady-state (mean) velocity information in concert with some type of computed random turbulence function related to measured RMS turbulence level (and is of the type described in Reference 4). It is expected that personnel in the NADC, Code 6053 Flight Dynamics Branch, will begin synthesis of an airwake math model along these lines, in the near future.

The second modeling approach would be to store the Strouhal scaled time history dynamic velocity data points directly in the computer, after first performing a time correlation of information from the various probes. This method appears to be somewhat tedious, but would be technically rigorous if pursued. Selection of the best data application methodology will depend upon the type of simulation undertaken, and how much storage capacity the simulation computers have available for modeling the turbulent and steady airwake flow fields.

## SECTION 2.0 INTRODUCTION

During June 1976, a wind tunnel test sponsored by the Naval Air Systems Command was conducted in the Boeing Vertol Low Speed VSTOL Wind Tunnel, to evaluate "airwake" turbulence generated by the hull and superstructure of a 1/50 scale FF 1052 U.S. Navy Frigate. The principal purpose of this test was to map steady and dynamic aerodynamic wake turbulence components with a grid of hot wire anemometers, in order to generate information for synthesis of ship airwake math models for flight simulation. As originally planned the wind tunnel effort was part of a joint NASC/Boeing Vertol multi-phase program set up to investigate the use of flight simulation technology as an avenue for reducing costly "Dynamic Interface" testing performed at sea (with new helicopters and ships), in order to generate launch/recovery and start up/shutdown Wind Limitation Diagrams.

At the close of the wind tunnel phase of this FF 1052 effort, technical cognizance over the program was transferred from NASC to the Naval Air Development Center (NADC), Johnsville. At about the same time, the U.S. Navy (in addition to its LAMPS helicopter activity) was beginning serious VSTOL development with a view toward operating these aircraft aboard small, non-aviation type combat ships. As a result, emphasis on continuing the Dynamic-Interface simulation project was switched to the higher priority VSTOL program. Airwake math models for the FF 1052 were synthesized from the BWVT wind tunnel data by both the Navy and private contractors (Reference 4 and 5), with the emerging VSTOL aircraft program in mind as an application goal.

In April 1977 a V/STOL Flying Qualities Workshop, jointly sponsored by the Navy (NADC) and NASA Ames was held in Monterey, California. One of the major conclusions of this conference was that wind tunnel airwake data for the DD 963 class destroyer was urgently needed for the Type A VSTOL program, to assist in design development of aircraft control systems and aerodynamics and ship interfacing hardware. The DD 963 had previously been designated as the smallest non-aviation type ship for VSTOL deployment.

During the summer of 1977 Boeing Vertol proposed to NADC, a three phase wind tunnel program to evaluate airwake turbulence generated by models of the DD 963 destroyer in the Boeing VSTOL tunnel. The initial phase of work suggested to the NADC Flight Dynamics Branch considered testing an existing 1/80 scale DTNSRDC "Stack Gas Investigation" type hull and superstructure model of the DD 963, with a program scope similar to that of the earlier FF 1052 effort. A proposed second and third phase add-on considered evaluating a larger 1/40 to 1/50 scale DD 963 model with motion capability; to answer questions about Reynolds Number, Strouhal Scaling Law, and motion effects which potentially exist when testing very small non-moving scale models of large ships.

In April 1978 a sole source contract (N62269-78-C-0097, Reference 6) was issued Boeing Vertol by NADC to perform a 1/80 scale DD 963 airwake test; essentially as proposed the previous year (in the suggested Phase I Program). This report documents results of testing accomplished to



fulfill the contract. A "waterline" type model was to be supplied by DTNSRDC, Carderock, Maryland, with appropriate modification of most superstructure and missile launcher equipment to ensure an up to date ship configuration for evaluation. U.S. Navy/Litton Industries drawings (plans) for the ship, serial number 145-4539600 (Revision K), were supplied by NADC to both Boeing Vertol and DTNSRDC for updating and validating model changes. In addition, DTNSRDC was charged with building adapter skirt blocks for interfacing the model with Boeing Vertol tunnel equipment.

Eighteen split-film hot wire anemometer probes utilized in the DD 963 test were the same set borrowed from the Federal Aviation Agency - National Aviation Facilities Experimental Center (NAFEC), Atlantic City, N.J., for the FF 1052 program. All 18 were sent to Thermo Systems, Inc. (the manufacturer) for refurbishment with new sensors, and recalibration. Seventeen units were finally rebuilt for the DD 963 program.

In mid 1978 when plans were well along for the NADC sponsored DD 963 test, the Naval Air Engineering Center (NAEC) in Lakehurst, N.J. joined the program, with a piggy-back effort to gather airwake data in the immediate area surrounding the flight platform of the vessel. This test, called the "Close-In" evaluation, was separately funded by NAEC under Contract N68335-79-C-1002 (Reference 7) and was planned initially to occur at the end of the NADC test. Its scope, in terms of runs to be conducted etc., was about half that of the Johnsville program.

Upon mutual agreement of both Navy agencies during the pre-test briefing (Reference 8) held at Boeing Vertol in March 1979, it was decided to integrate the two programs where possible to maximize the amount of test data acquired. Combining programs permitted all flow visualization work to be conducted as a single concurrent package. "Tailwind" tests were also integrated for both programs. Test results from the Close-In Program will be published in December 1979.

Since the principal contractor objective for both the NAEC and NADC "airwake" test programs was to generate and record on magnetic tape time histories of three component turbulence velocities, and to produce listings of mean and standard deviation velocity component information, no attempt has been made by the contractor to conduct a comprehensive in depth analysis of the test results for this report. Rather, the data have been meticulously reviewed for validity, and samples of the more interesting preliminary analysis results plotted for presentation herein.

At the present time, it is anticipated that Flight Dynamics Personnel at NADC (Code 6053) will develop an airwake math model for the DD 963 Destroyer, based upon information generated under this contract. Inquiries related to development of this math model should be directed to the Johnsville facility.

It is further expected that Close-In results documented in Reference 12 will be utilized by the NAEC R&D office (Code 91B1), for additional detailed modeling of the turbulence surrounding the DD 963 flight platform. Inquiries regarding Close-In results should be referred to the appropriate NAEC office.

### SECTION 3.0 MODEL GEOMETRY

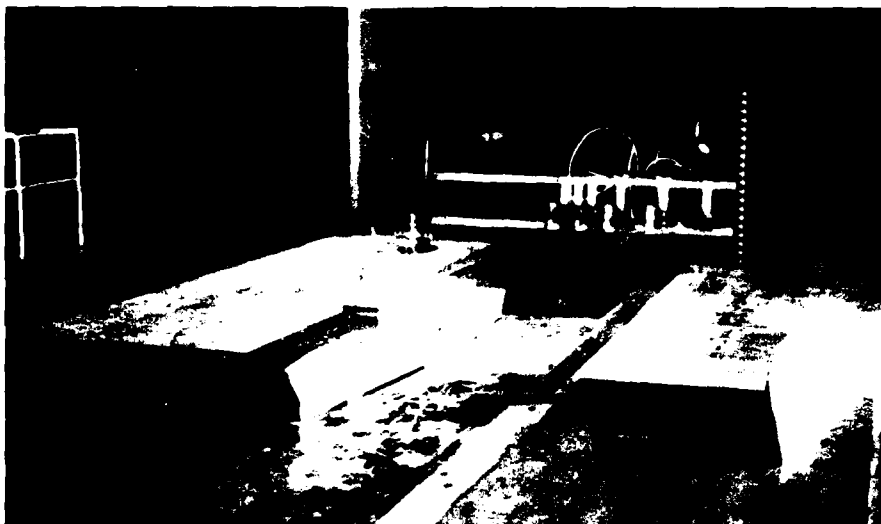
As discussed in the Introduction, the ship model provided for the wind tunnel test was built by the David Taylor Naval Ship Research and Development Center (DTNSRDC), located in Carderock, Maryland. The model had been used previously by DTNSRDC for underwater Stack Gas Plume ("Smoke") Investigations in the Circulating Water Channel Tunnel, to evaluate two classes of Destroyer - the DD 963 and DDG-47. Hull serial number 5348-4 represented an early version of the Spruance Class DD 963, but substantial changes in mast superstructure and missile equipment were required to update the configuration for the test described in this report.

Details of changes required for the 5348-4 model (which were given to DTNSRDC for its modification work) were taken from a series of drawings and photographs provided by the DD 963 Project Class Desk at the Naval Ship Engineering Center (NAVSEC) in Washington, D.C.. Inboard profile type Litton Industries drawings (plans) for the ship (see Introduction for Serial Numbers, etc.) were used to detail modifications required in the mast and radar antenna configuration. U.S. Navy photos delineated Sea Sparrow missile launcher/director configuration details, and these are listed in the Figure 1 notes. Boeing Vertol supplied dimensions for the required adapter skirt mounting blocks, utilized in installing the ship at 0° and +15° roll angle on the tunnel yaw turntable flange.

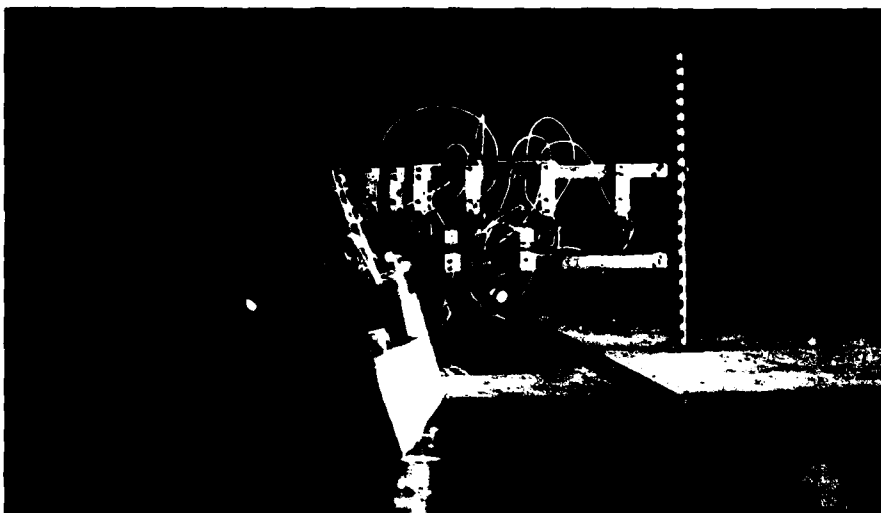
When the model arrived from DTNSRDC for the BWWT test, several minor errors in configuration were discovered. The most serious of these is pointed out in Figure 1, and was related to the fact that the yaw pivot center for the model was located 0.87 inches behind where it should have been (through the landing platform centerline). Because of the adapter block construction, it was determined that moving the yaw center to the desired location was virtually impossible. Thus the test was conducted with the pivot center located as supplied by the Navy. It should be noted that the earlier FF 1052 model (Reference 1) had a similar mismatch, but this was caused by a deck bullseye location change on the Knox Class Frigates.

Details of the model configuration tested in the BWWT 242/243 wind tunnel program are illustrated in Figure 13, and in drawings and photos presented earlier in Figures 1, 2, and 3. Figure 13 clearly shows what the two inch high adapter skirt blocks look like, both before and after installation. As shown at the bottom of the figure hull mold lines fair smoothly into the adapter block without steps or gaps - even for the 15° roll attitude configurations.

Installed under the bow on all three adapter blocks was a roller which permitted the skirt to just clear the groundplane as the hull was yawed. The hull was bolted to the adapter block fore and aft and the adapter bottom fastened to an extension of the tunnel yaw table flange (flush with the top of the groundplane) as shown in Figure 1. A "foam" aerodynamic seal was installed between the adapter and groundplane. With this arrangement, virtually no airflow passed beneath the ship, and any



DD963 MOUNTED ON 0° ROLL ADAPTER SKIRT - WITH 15°  
RIGHT ROLL ADAPTER ABOUT TO BE INSTALLED  
RAKE CONFIGURED WITH "LOWER" PROBE ARRAY TO MEASURE  
NEAR-DECK & HANGAR ROOF HEIGHT TURBULENCE



HEAD ON VIEW OF HULL ROLLED 15°  
PROBE ARRAY RAISED TO "UPPER" POSITION FOR MEASURING  
FLOW IN PLANE OF STACK UPTAKES & MAST RADAR ANTENNAS

Figure 13. MODEL TEST CONFIGURATION

yaw angle from 0 to 180 degrees (in either direction) could be set up as desired.

## SECTION 4.0 TEST EQUIPMENT AND INSTRUMENTATION

The major elements of test equipment and instrumentation used in the BVWT 242/243 DD 963 airwake turbulence program include the hull and adapter skirt blocks described earlier in Section 3.0; the wind tunnel test section and groundplane installation; and the anemometer probes with their mounting rake and associated electronic and pneumatic power supply packages. Additional test equipment consisted of several devices which produced smoke or helium filled soap bubble filaments for flow visualization studies. These flow visualization runs were photographed with a 70 MM Hasselblad still camera, and both conventional and strobe synchronized 35 MM motion picture cameras.

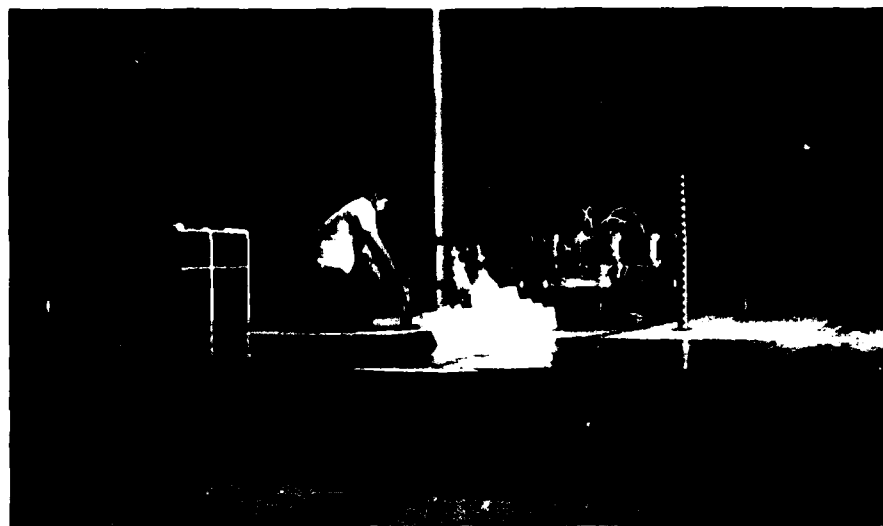
Except for the ship, other equipment used in BVWT 242/243 was essentially the same as utilized in the earlier FF 1052 Frigate program. The function of major pieces of equipment or instrumentation is described briefly in this section of the report.

### 4.1 WIND TUNNEL AND GROUNDPLANE

The Boeing Vertol Low Speed VSTOL wind tunnel 20 by 20-foot test section was set up in its "slotted wall" configuration for the test, with a fixed (non-moving) groundplane installed 14 inches above the tunnel floor. Groundplane details are illustrated in Figures 1, 5, and 14. As shown in the sketches, and in the photo at the top of Figure 14, the 20-foot square groundplane extends from wall to wall laterally, and is centered at WT Station 1000 (which is the center-line of the tunnel test section). Tunnel and groundplane configuration is identical to that used in the earlier (Reference 1) program.

The smooth surface groundplane is constructed of plywood sections approximately 1 inch thick, and is mounted on an aluminum I beam support system which facilitates its installation and removal from the tunnel and provides access to the area beneath the model when required. A streamline leading edge is attached along the forward lip (Figure 1) to prevent flow separation, and tunnel flow passes freely both above and below the groundplane surface.

The purpose of using a groundplane for the test was to eliminate undesirable effects of the wind tunnel floor boundary layer velocity gradient, which is relatively thick in the area where the model would be located for testing. Boundary layer growth along a "flat-plate" mounted parallel to the flow (which the groundplane essentially represents) is readily predictable, and varied from practically no thickness at all at the groundplane leading edge, to approximately 4 inches at its trailing edge (as measured in the FF 1052 program). Assessments of groundplane boundary layer thickness were made in the area where the ship was mounted and confirmed predictions quite well, as will be described later. The location of the DD 963 hull for the BVWT 242/243 test was very close to that used in the FF 1052 program and thus the groundplane boundary layer survey results from the earlier test apply equally well.



FIXED 20 FT X 20 FT GROUNDPLANE MOUNTED ABOVE  
TUNNEL FLOOR - WITH DD963 HULL & ANEMOMETER  
RAKE INSTALLED



PROBES & RAKE SPREADER ATTACHMENT HARDWARE WITH  
PROTECTIVE SHIELDS RETRACTED IN PREPARATION FOR  
TURBULENCE MEASUREMENT

Figure 14.

As indicated earlier in Figures 1 and 5, the model could be yawed + 180 degrees about its landing pad, through a remotely controlled extension of the test section yaw table. The tunnel operator was able to select desired yaw angle, and then set it through use of a yaw potentiometer readout on the operator's console. Yaw sweeps were made in both directions, to account for expected differences in flow produced by asymmetrical elements of superstructure (stacks), located on either side of the ship centerline.

#### 4.2 HOT WIRE ANEMOMETER PROBES AND MOUNTING RAKE

Model 1296E (1080-System) split-film hot wire vector anemometer probes, manufactured by Thermo Systems Inc. in 1970, were used to measure three-component velocity information for the airwake turbulence test. The 1296 probe senses velocity magnitude and direction over the full 360 degree solid angle in any three dimensional flow field, with a DC response capability of up to 1 kHz as described in Reference 9. Figure 15 presents a sketch and photograph of a single probe unit, along with associated electronic and pneumatic system elements.

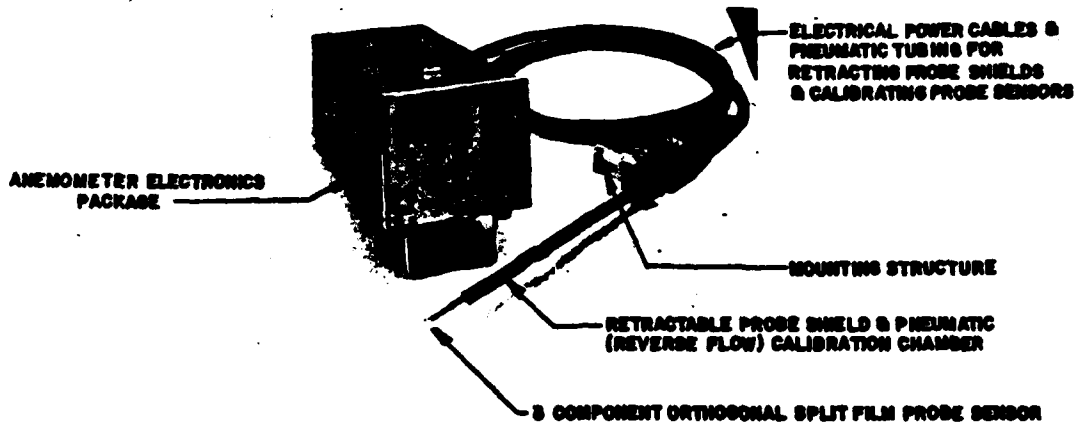
As seen at the bottom of the figure, the probe consists of three mutually perpendicular sensors oriented 120 degrees apart. Each cylindrical sensor is made up of two quartz covered platinum split-film elements operated at constant temperature, which produce a heat-flux differential when placed in a flow field. This differential is sensed as voltage signals generated by both sensor elements. These are combined with similar voltages from the other two sensors to form three component velocity information as described in the Reference 10 TSI data reduction document.

The data reduction program used to develop the velocity information from the sensor voltages is capable of outputting either  $V_x$ ,  $V_y$ , and  $V_z$  components, or  $V_{TOT}$  with its angular orientation. The three component velocity alternative was selected for the DD 963 airwake turbulence test to ensure compatibility of results with existing flight simulation math models. Velocity computation from the sensor voltage signals was performed in the Wind Tunnel IBM 1800 computing system, on a non-real-time basis, both during and after the test.

In addition to the electronics package, each probe has a pneumatically retractable shield (shown clearly at the bottom of Figure 14) which was automatically extended over the probe sensors for protection when not in use. The shield also serves as a flow calibration nozzle for instantaneous in-place recalibration checks of probe performance.

Throughout the test program the anemometer probes were installed together on a portable mounting rake to form a grid as shown in Figures 4 and 16. Right yaw runs in the headwind/crosswind sequence had most of the probes located on the right hand side of the rake (as illustrated in Figure 16) to pick up major areas of turbulence behind the ship. Left yaw orientation was exactly the opposite.

### PRINCIPAL SYSTEM COMPONENTS



### MODEL 1080 - THERMO SYSTEM INC. SPLIT FILM HOT WIRE ANEMOMETER PROBE & ELECTRONICS PACKAGE SKETCH

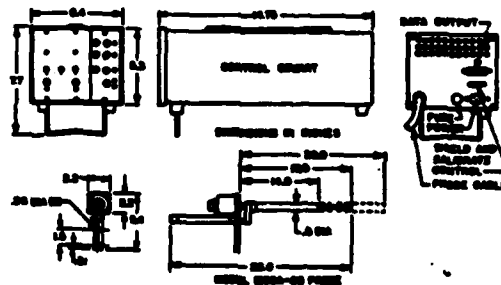


Figure 15. TOTAL HOT WIRE ANEMOMETER SYSTEM



# DD963 DESTROYER AERODYNAMIC WAKE TURBULENCE TEST BVWT 242/243

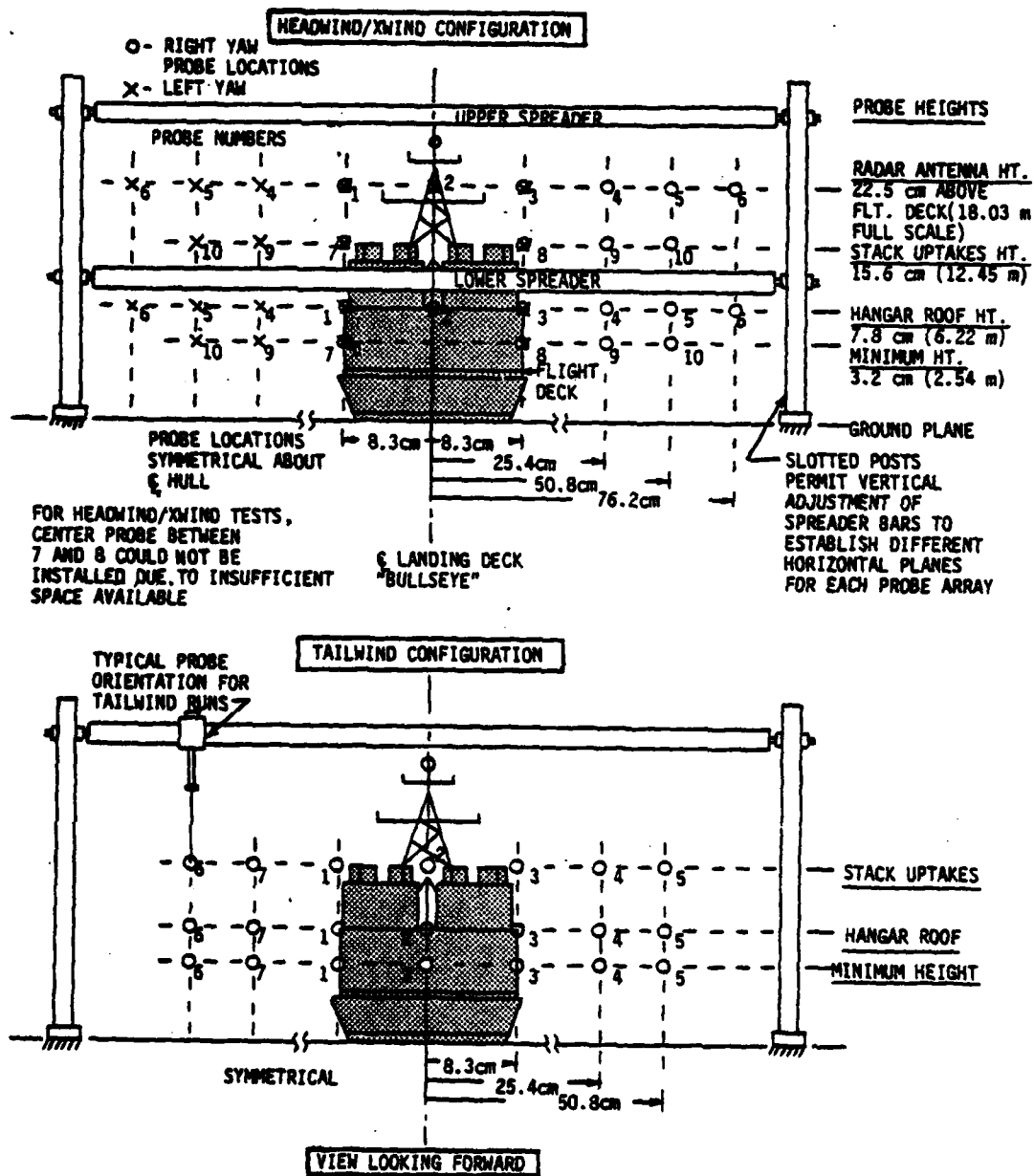


Figure 16. VERTICAL AND LATERAL ANEMOMETER PROBE SPACING ON RAKE MOUNT

Ten probes were operational on the rake at all times during the headwind/xwind evaluations; and these were arranged into two separate arrays of two horizontal rows each. The group nearest the deck was called the lower array. Probes were located 3.2 cm and 7.8 cm above the landing deck. The other probe grouping (called the upper array), positioned the probes behind the stack/mast area in planes 15.6 cm and 22.5 cm above the landing deck.

Tailwind testing, as shown in Figures 3 and 16, utilized a different probe orientation (with vertical mounting) as described earlier. Only one horizontal plane at a time could be mapped with this configuration of anemometers. Vertical installation was required to prevent probe/hull collisions, as the ship was yawed; and to ensure that the probes did not interfere with aerodynamic flow around the aft end of the ship (which would have occurred with horizontal mounting).

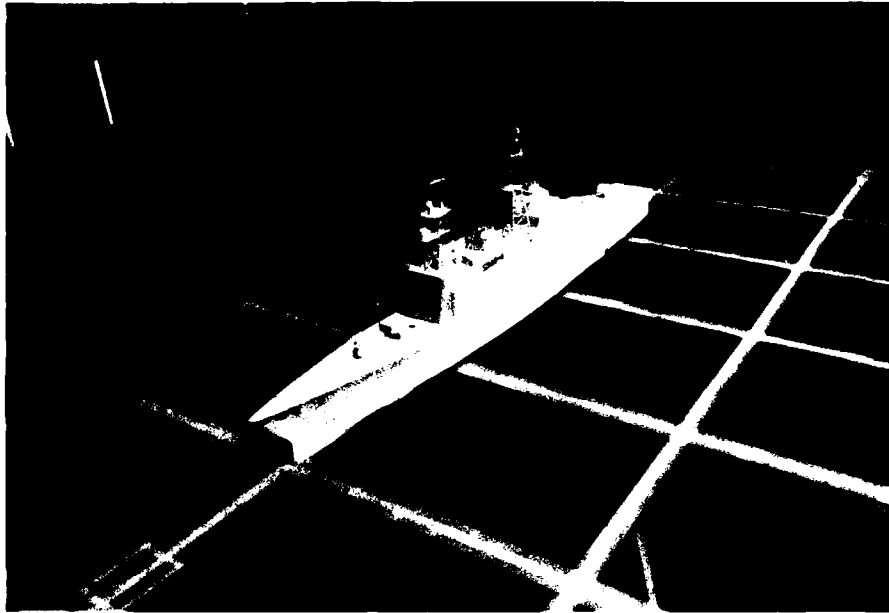
Both upper and lower rake "spreader" bars were adjustable vertically, to move the probe arrays up and down. The rake itself could be moved back and forth longitudinally behind the ship to map points in the wake, as shown earlier in Figures 4 and 5. For each headwind/xwind rake position, 1 through 5, the device was securely bolted down to the groundplane surface to prevent error inducing vibration of the probe sensor heads. "Tailwind" rake locations 1 through 5 are designated on the right hand side of Figure 4, with either an "A" or "C" nomenclature. Test locations annotated with an A were used in the NADC test, and the C designation applied to the "Close-In" Lakehurst NAEC test configurations.

#### 4.3 FLOW VISUALIZATION STUDY EQUIPMENT

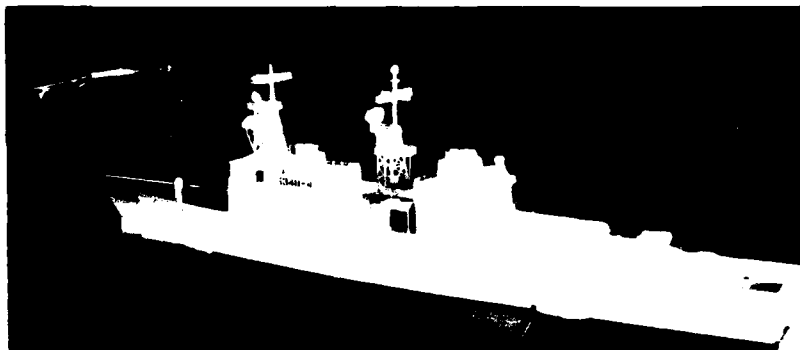
Smoke - Chemically generated smoke (produced by combining sulphur dioxide and anhydrous ammonia gasses) was injected into the airflow around the ship model through a movable 13 foot long two-tube "wand" and nozzle arrangement. This was done in order to identify areas of turbulence and separation behind the ship for later positioning of anemometer arrays. The nozzle was sufficiently small to prevent flow expansion until the smoke reached the lee side of superstructure elements. The wand was manually positioned in the tunnel by extending it through one of the wall slots out to the model in the center of the test section.

Still photography of the separated wake was accomplished with 70MM cameras mounted beside and above the model. A 35MM movie camera, with its shutter synchronized to a strobe light mounted in the tunnel ceiling was utilized to document (in color) flow visualization studies conducted on the first day of the test. A separate conventional 35MM camera photographed the flow from the-side of the tunnel.

To enhance photography during the smoke tests, a black and white grid pattern was attached to the groundplane (and tunnel wall) as shown at the top of Figure 17. Ship yaw angles established for the flow viz work were prominently displayed on the horizontal grid, so that movies taken from above require no subtitling to be understood.



HULL ON 2 FT SQUARE BLACK SMOKE FLOW VISUALIZATION GRID - NOTE MARKINGS FOR YAW HEADING ON FLOOR & TUNNEL WALL GRID FOR OBSERVING VERTICAL FLOW PATTERNS



HELIUM-SOAP BUBBLE GENERATING NOZZLE & WAND HELD ABOVE BOW WHILE DISPENSING FLOW



EQUIPMENT SETUP FOR PHOTOGRAPHING SOAP-BUBBLE TRACKS WITH XENON "SUPER TROOPER" THEATRICAL-TYPE HIGH INTENSITY COLLIMATED SPOTLIGHT IN FOREGROUND - AND MOVIE/STILL CAMERAS ON LEFT

Figure 17. FLOW VISUALIZATION EQUIPMENT

Helium Filled Soap Bubbles - Multiple helium filled soap bubble stream filaments were generated with a special hand-held "wand" resembling a keil tube, in order to visualize flow patterns around the ship. The soap bubbles are formed with helium, providing neutral buoyancy characteristics so that each bubble stream followed the local flow pattern. Bubble streams were illuminated with a bright Xenon theatrical type spotlight mounted behind, and to the side of the ship, with all other tunnel lighting turned off. The soap bubble "flow viz" testing was conducted after completion of the smoke evaluation on the first day of the test. Movies of this very interesting flow study were unsuccessful in highlighting the bubble tracks. On the last day of the program, soap bubble photography was again attempted, with the same results.

Despite the problem with the soap bubble movies, numerous Polaroid and Hasselblad still photos were taken successfully of the flow around the hull and superstructure.

## SECTION 5.0 TEST PROCEDURE AND CONDITIONS

SYNOPSIS - As in the earlier FF 1052 evaluation, testing related to mapping DD 963 airwake turbulence began long before the ship model was mounted in the tunnel. Extensive refurbishment and calibration of the anemometer probes was accomplished by Thermo Systems Inc. (the probe manufacturer. When returned to Boeing Vertol each was rechecked in a "TSI Calibrator" unit to confirm factory cal constants.

After installation of the groundplane in the tunnel, the model was bolted to the yaw table extension flange and smoke flow visualization studies conducted. This testing was accomplished at the outset of the program to verify that locations selected for the anemometer arrays on the rake would, in fact, identify major areas of turbulence affecting V/STOL or helicopter operations aboard the full scale vessel. With probe array configuration requirements confirmed from the smoke tests, a number of helium/soap bubble flow viz runs were made to qualitatively assess and photograph details of the bound and shed vortex patterns in the lee of prominent superstructure elements. This testing was repeated at the end of the program in an unsuccessful attempt to take movies of the bubble tracks, as they passed through the turbulence.

Quantitative measurement of the airwake turbulence followed the flow visualization effort. Over 740 test points were taken with the hull installed upright, and rolled right or left 15 degrees. About three quarters of these velocity measurement runs represented headwind/crosswind conditions, and the remaining "tailwind" data points were taken with the ship's fantail pointing into the tunnel flow.

Information presented in the remainder of this section briefly reviews the various elements of the test program just outlined, with documentation of exactly what was done - and why.

### 5.1 ANEMOMETER REFURBISHMENT, RECALIBRATION, & OPERATION

At the start of the DD 963 program, eighteen anemometer probes (used in the earlier FF 1052 test) were made available to Boeing by the government. Because of the questionable or completely inoperative status of most of these devices at the end of the earlier test, all were returned to TSI for sensor replacement, refurbishment as necessary, and calibration. All three sensor units on each anemometer were replaced by the manufacturer, and the probe electronics cards rezeroed to match wind tunnel cabling, buffering interface electronics equipment etc. One of the probes shipped to TSI was considered to be so badly damaged that it could not be repaired for the DD 963 effort.

Of the seventeen refurbished probes sent back to Boeing, all but one repeated the factory calibration when installed in the calibrator unit. The probe not repeating the factory calibration was worked on by the wind tunnel instrumentation staff, but never achieved servicable status during the program.

At the start of testing, ten probes were installed on the rake. A number of these suffered "balance" problems when connected to the very long cables in the tunnel, running from the test section to the electronics processing units. Capacitance of cabling in the tunnel was apparently somewhat different from assumed values used by the factory in setting up the electronics cards for each probe.

Wind tunnel personnel were able to eliminate the problem (through a minor resistor change on the card) for all but three probes. An attempt to thermal "shock" these unusable probes with large applications of current to change internal resistance (so that they could be balanced), was not successful. As a result, only thirteen operative probes were available for velocity measurement at the start of testing (out of the original group of 18).

Shortly after testing started, one probe was struck by some small piece of debris in the flow during a run, and all three cantilever mounted sensors were destroyed. The probe was replaced with a spare. A similar sensor problem occurred during the first rake probe array change, and two more probes were rendered unservicable.

For virtually all headwind/crosswind testing, ten probe positions on the rake were being utilized as planned. From time to time, individual sensors failed through shorted or open circuits, and the probes were replaced with spare units when the failure was identified. Occasionally, failures were not found with on-line monitoring systems until several runs had been made following the onset of the problem. Because of the vast amount of data being acquired in the limited test time available, these runs were not repeated when only one probe in an array had failed. On several occasions, "low-speed" averaged velocity data taken on-line indicated satisfactory probe performance (when, in fact, failures in multiplexing data channel circuitry had occurred, thereby rendering the off-line "high-speed" information intended for post-test processing unusable).

A detailed annotation of all malfunctioning probes, and associated run and test point numbers is presented in the report Appendix B, preceding the data listings of mean and standard deviation velocity information.

## 5.2 BOUNDARY LAYER SURVEY

Although no survey of the groundplane boundary layer velocity gradient was made for the DD 963 (BVWT 242/243) test, information gathered during the earlier FF 1052 test is considered to be valid for the destroyer evaluation, and is therefore presented in this report to aid the reader in understanding the flow environment around the DD 963 hull.

In the Reference 1 (FF 1052) survey, velocity gradient above the groundplane was measured at the model yaw center, and at the ship bow with the vessel at 0° and 90° yaw. Since the FF 1052 model was

somewhat larger than the DD 963 (8 Ft.-10 In. vs 7 Ft. overall), the "bow" location for both ships was not in the same place on the groundplane. Luckily, the initial test was with the larger ship, and its bow was located three feet aft of the forward edge of the groundplane; whereas the bow of the smaller DD 963 was located 4.75 feet aft at zero yaw (see Figure 5). Simple interpolation of the measured boundary layer data from the three foot and  $\xi$  positions (using information on boundary layer growth discussed in Reference 2), will produce desired velocity ratios for any station along the DD 963 hull planform.

Boundary layer measurements were taken with tunnel speed set at 20, 35, and 50 knots during the FF 1052 test, which exceeds the range of speeds evaluated during the DD 963 program. Again, interpolative techniques can be applied to derive the desired DD 963 information as required.

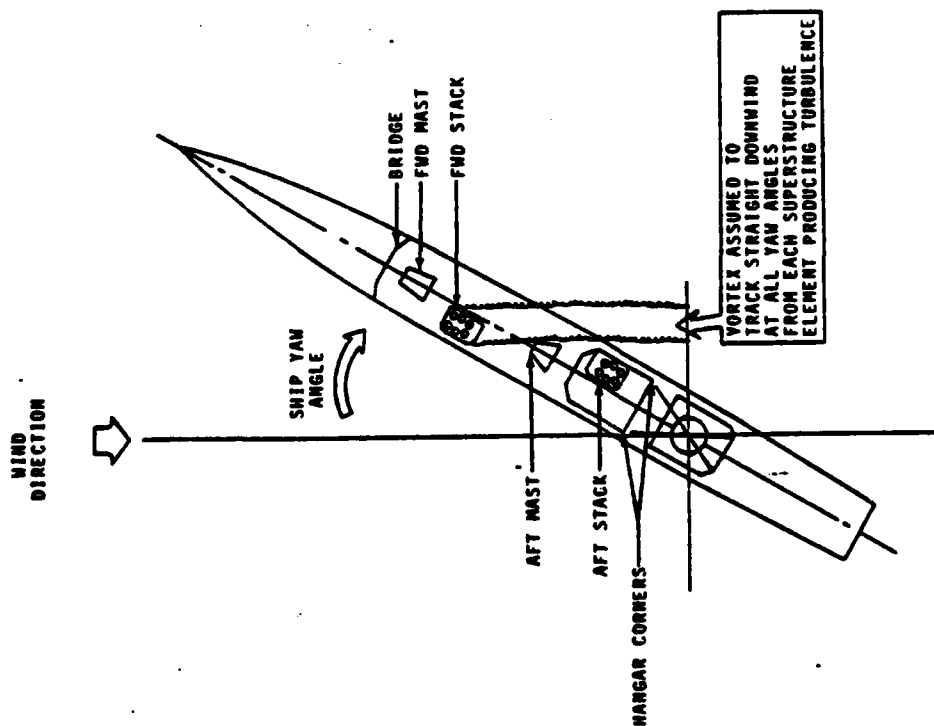
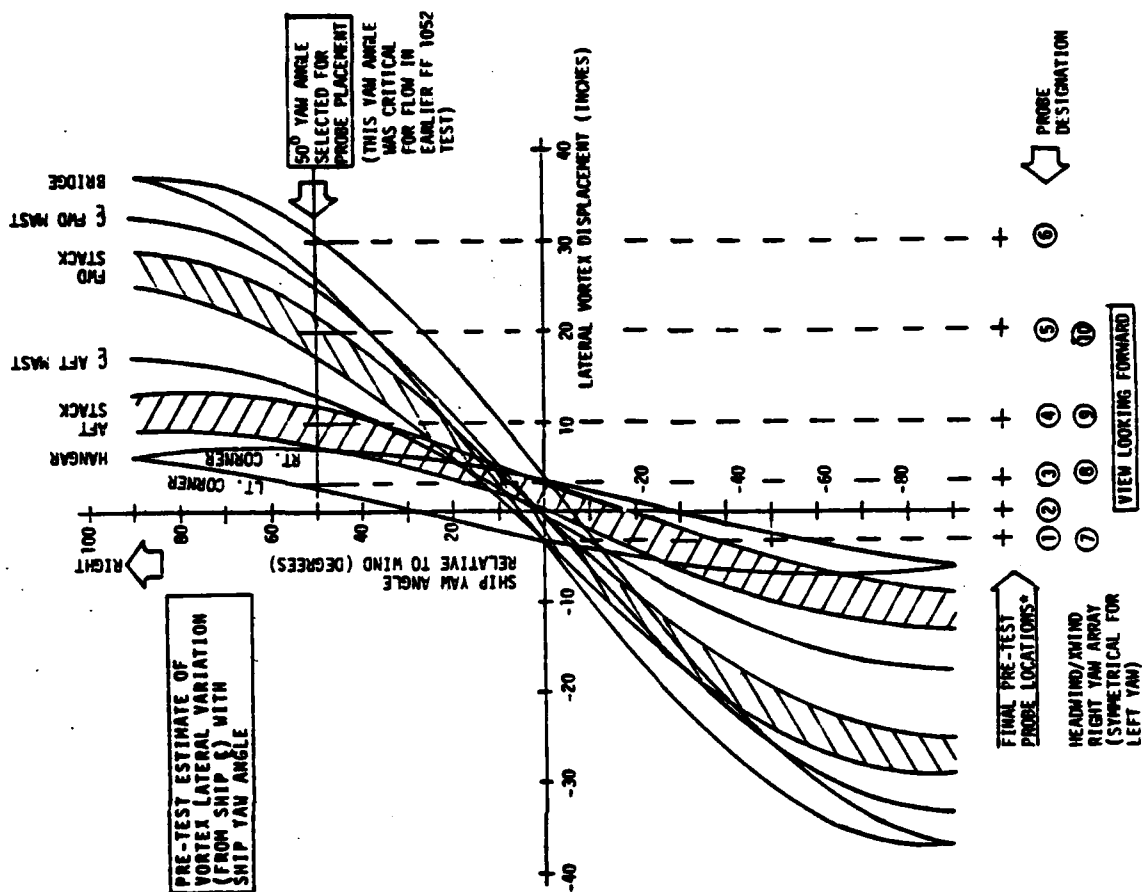
### 5.3 FLOW VISUALIZATION STUDIES TO CONFIRM PROBE ARRAY CONFIGURATION, AND OVERALL NATURE OF AIRWAKE TURBULENCE

Predictions - Before the test, an estimate was made to determine where major vortices shed by elements of the DD 963 superstructure would lie, as the ship was yawed from  $0^\circ$  to  $90^\circ$  in both directions. The principal vortex streets creating important areas of wake turbulence were expected to emanate from corners of bridge and hangar superstructure, and from both masts and exhaust gas stacks. Results of the pre-test predictions are illustrated in Figure 18.

In the earlier test of the FF 1052, yaw angles between  $30^\circ$  and  $50^\circ$  produced the greatest flow disturbance, in the range of wind-over-deck headings most likely to be used for VSTOL and helicopter launch and recovery operations. On the basis of this observation,  $50^\circ$  was selected as a ball-park start for probe positioning in the DD 963 test (as shown on the right hand side of Figure 18). Information presented later in the report (in Section 6), will confirm these positioning estimates to be reasonable for the Destroyer Airwake Program, despite swerving of the flow downwind of the vessel observed during smoke testing.

Smoke Studies - To verify assumptions just described, flow visualization studies with the smoke "wand" discussed in Section 4.3 were conducted with tunnel speed stabilized at 20 knots. The wand was positioned to eject smoke into the flow field in front of various elements of superstructure including the bridge, forward mast and stack, aft mast and stack, and the hangar. Flow around the landing platform was also extensively checked. Ship yaw angles from  $0^\circ$  to  $180^\circ$  in both directions were evaluated.

Behind the ship, the anemometer rake was set up with 10 "dummy" wooden probes mounted on it in the locations suggested in Figure 18. An observer was stationed above the tunnel test section to look down on the smoke flow field and ensure that the selected probe spacing



\* FLOW VIZ TESTING WITH SMOKE (FROM 00 TO 1800 YAW) CONFIRMED THAT PRE-TEST PROBE ARRAY PATTERN SELECTION WAS ADEQUATE FOR MEASURING MAJOR AREAS OF AIRWAKE TURBULENCE OBSERVED IN FLOW

Figure 18.



would, in fact, cover the areas of heaviest turbulence. A second observer viewing the ship through the tunnel side wall window, estimated vortex vertical height at different distances downstream by comparing the flow with the tunnel wall mounted grid, to confirm the horizontal probe plane levels selected for testing.

Stroboscopically synchronized color movie film (at about 25 frames per second) was taken from above the tunnel roof and slightly aft of the ship for each test condition; and both conventional 35MM color movies and 70MM still photographs were made from the side of the test section. Attempts to "freeze" major elements of the turbulent flow with the strobe light, to identify frequency content, were not successful.

Helium - Soap Bubble Tests - Use of helium filled soap bubble tracks to delineate flow around the superstructure was also attempted during the flow visualization program (just as had been done experimentally in the earlier FF 1052 effort). For this type of test, the hull was illuminated from the rear by an extremely bright Xenon spotlight (with other tunnel lights turned off). This back lighting caused the soap bubble tracks following the local flow pattern to be visible. A polaroid camera was used to experimentally derive the best combination of (f) stop and shutter speed to photograph the bubble tracks. With these settings determined, a 70MM Hasselblad still camera was adjusted accordingly and then used to photograph testing conducted as the ship was yawed, as in the smoke tests (see Figure 17).

In addition to still photography, color movie film was also made of the bubble tracks. Negative results caused the bubble tests to be repeated on the last day of the program - but again the bubble tracks were not visible on film. Since the FF 1052 soap bubble color movies taken in 1976 were able to delineate the tracks fairly well, it is recommended that prior to any ship flow visualization work attempted in the future, pre-test photographic experiments be run to determine what film & shutter speeds, and (f) settings are necessary to produce satisfactory results.

#### 5.4 SHIP AIRWAKE VELOCITY MAPPING

Headwind/Crosswind Testing - With probe locations on the anemometer rake confirmed by the flow visualization studies, a comprehensive program to quantitatively map the airwake turbulence flow field was undertaken. The ship was set up initially at zero roll angle, and yaw sweeps to the right were accomplished as outlined in the Table 1 summary. The first probe array utilized was the "lower" right yaw setup indicated at the top of Table 2. Initial yaw sweeps started with the rake positioned so as to place probe sensors in a vertical plane passing through the landing platform bullseye (as shown in Figure 4).

Yaw runs were repeated at 20, 35 and 45 knots, before moving the rake aft to the next position located above the aft end of the "01"

RUN NO.	PROBE CONFIGURATION ①	RAKE LOCATION ②	SHIP ROLL ATTITUDE	SHIP YAW ANGLE ③ (DEGREES)										VELOCITY (KTS.)	COMMENTS
				0	30	50	90	120	150	180	210	240			
9-11/48-50 13-15/52-54 16-18/55-57 19-21/58-60 22-24/61-63	1/2	1 2 3 4 5	0°	R	R	R	R							20.35 45	Headwind/Twin Test Right Yaw 0° Roll
111-113/93-95 115-116/91-92 117-118/89-90 119-120/87-88 121-122/85-86	3/4	1 2 3 4 5	0°	L	L	L	L							20.45	Left Yaw 0° Roll
34-35/75-76 32-33/77-78 30-31/79-80 28-29/81-82 26-27/83-84	1/2	1 2 3 4 5	+15°	R	R	R	R							20.45	Right Yaw +15° Roll
128/110 127/109 126/100 125/99 124/98	3/4	1 2 3 4 5	+15°	L	L	L	L							20	Left Yaw +15° Roll
36-37/73-74 38-39/71-72 40-41/69-70 42-43/67-68 44-45/65-66	1/2	1 2 3 4 5	-15°	R	R	R	R							20.45	Right Yaw -15° Roll
133/104 132/105 131/106 130/107 129/108	3/4	1 2 3 4 5	-15°	L	L	L	L							20	Left Yaw -15° Roll
168-169/188-189/ 170-171/186-187/ 202-203 172-173/184-185/ 174-175/182-183/ 176-177/178-179/ 204-205 /180-181/ 206-207	5/6/7	1C 2C, 1A  3C 4C 5C, 2A  3A	0°					R	R	R	R	R	R	20.45	Tailwind Test 0° Roll
190/201 191/200 192/199	6/7	2C, 1A 5C, 2A 3A	+15°					R	R	R	R	R	R	20	+15° ROLL
195/196 194/197 193/198	6/7	2C, 1A 5C, 2A 3A	-15°					R	R	R	R	R	R	20	-15° Roll
12/51 25/64	1/2	1 5	0	R	R									45	10 Sec Runs
114/96 123/97	3/4	1 5	0	L	L									45	
208	6	2C, 1A	0	R	R, L	R, L								20	
1-8, 209 46 47 101-103 134-167															
FLOW VISUALIZATION TEST MODEL OUT OF TUNNEL REPEAT OF RUN 9 REPEATED IN RUNS 109-110 DD963 "CLOSE-IN" AIRWAKE TURBULENCE TEST															

#### NOTES

- ① ANEMOMETER PROBE ARRAY CONFIGURATION DESCRIBED SCHEMATICALLY IN TABLE 2
- ② AS DESCRIBED IN FIGURE 4 SKETCH
- ③ R - REFERS TO A YAW TO THE RIGHT; L - YAW TO THE LEFT

EXCEPTIONS TO CONDITIONS LISTED IN THIS TABLE ARE GIVEN IN TABLE 3 OF APPENDIX B WHICH LISTS MEAN AND STANDARD DEVIATION VELOCITY TEST RESULTS.

Table 1. TEST MATRIX SUMMARY  
DD963 SHIP WAKE TURBULENCE TEST - BVWT 242/243

VIEW LOOKING FORWARD

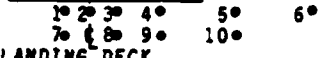
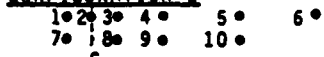
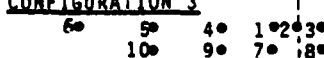
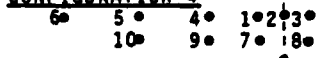
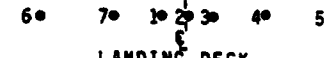
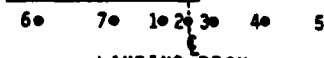
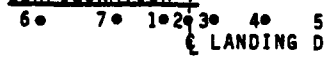
PROBE CONFIGURATION ARRAY	PROBE HEIGHT (ABOVE LANDING DECK)-METERS F.S.	USED FOR RUN CONDITIONS
<b>PROBES MOUNTED HORIZONTALLY FOR HEADWIND/XWIND TEST</b>  <b>CONFIGURATION 1</b>  LANDING DECK	6.22 HANGAR ROOF 2.54 MINIMUM HEIGHT	<b>HEADWIND/XWIND TEST</b>  RIGHT YAW LOWER ARRAY
<b>CONFIGURATION 2</b>  LANDING DECK	18.03 RADAR ANTENNA 12.45 STACK UPTAKES	RIGHT YAW UPPER ARRAY
<b>CONFIGURATION 3</b>  LANDING DECK	6.22 HANGAR ROOF 2.54 MINIMUM HEIGHT	LEFT YAW LOWER ARRAY
<b>CONFIGURATION 4</b>  LANDING DECK	18.03 RADAR ANTENNA 12.45 STACK UPTAKES	LEFT YAW UPPER ARRAY
<b>PROBES MOUNTED VERTICALLY FOR TAILWIND TEST</b>  <b>CONFIGURATION 5</b>  LANDING DECK	2.54 MINIMUM HEIGHT	<b>TAILWIND TEST</b>  LOWER ARRAY
<b>CONFIGURATION 6</b>  LANDING DECK	6.34 HANGAR ROOF	MIDDLE ARRAY
<b>CONFIGURATION 7</b>  LANDING DECK	12.45 STACK UPTAKES	UPPER ARRAY

Table 2. PROBE CONFIGURATION ARRAY COMBINATIONS

Deck; where the process was repeated. As the rake was moved further aft, greater and greater yaw angles could be reached before interference occurred between the ship and probe sensors (Table 1 reflects this expanded yaw coverage).

When the yaw sweep series was completed for the final rake location (one ship length downstream of the bullseye), the hull was rolled 15° to the right and the series repeated at 20 and 45 knots (see Table 1), as the rake was moved progressively in steps closer and closer to the ship landing deck. After completing the final run with probes over the landing deck G, the hull was rolled 15° left and the sequence was duplicated again. With all right yaw "lower" array (configuration 1) tests completed, rake spreader bars were raised to achieve the "upper" array, shown as configuration 2 in Table 2.

As illustrated in Table 1, runs with the "upper" right yaw array were then made, essentially duplicating those with the "lower" configuration, thereby completing the mapping task to the right. By switching probes from the right hand side of the rake to the left, configurations 3 and 4 (Table 2) were achieved, and the entire data gathering process was repeated for left yaw sweeps. On the basis of mean velocity comparisons made for 20 and 45 knot runs (which indicated that data could be scaled directly with remote wind speed), the 35 knot sweeps were not repeated in left yaw.

Tailwind Testing - Following completion of the headwind/crosswind evaluation, tailwind testing was accomplished (starting at run 168), utilizing the rake configured with vertically mounted probes as previously discussed and annotated in Table 2 and at the bottom of Figure 16. Only one horizontal row of probes at a time was active (see Tables 1 and 2), and the rake was moved fore and aft to completely map a single plane before being reconfigured for measuring data at the next higher horizontal level. Tailwind measurements were taken at 20 and 45 knots as indicated in the table.

Tailwind yaw sweeps were attempted for +60° on either side of the 180° yaw angle, but probe/hull interference often precluded reaching the desired maximum angle. A detail listing of all yaw angles set up for this testing is given in Table 1 and in Table 3 (which precedes the data listings). Table 3 also annotates which probes were inoperative, or malfunctioning during each run.

## 5.5 DATA RECORDING AND PROCESSING

Velocity information from the anemometer probes was recorded and processed on the BVWT "WINDEE" - IBM 1800 computing system mentioned earlier. Raw probe sensor data stored initially on tape was processed in the Reference 10 data reduction program, which converted the results to engineering units and resolved the resultant velocity information into Vx, Vy and Vz components. Further processing corrected for probe mounting orientation, so that Vx was always (+) in the downstream direction parallel with the tunnel centerline;

$V_y$  (+) to the left looking upwind; and  $V_z$  (+) upward and perpendicular to the groundplane. This velocity convention was maintained regardless of ship heading, in order to simplify later application of the data in flight simulation work.

Dynamic velocity data were recorded after first establishing the desired hull yaw angle and stabilized tunnel speed. Each data recording burst consisted of three separate segments, two of which were utilized in the data reduction process. The first consisted of approximately one second of "low speed" data sampled at 124 samples per second per channel. These data were averaged to form mean  $V_x$ ,  $V_y$ , and  $V_z$  velocity components for "on-line" checks of probe performance. The data were plotted in velocity map format while the test was in progress, to get an idea of what the total flow field behind the ship looked like. Because of a tunnel data system limitation, only nine of the ten probes installed on the rake could be monitored (on-line) at any one time - data from the tenth probe was stored on tape for post-test processing.

The second portion of the data segment consisted of an 0.8 second burst of "high speed" information sampled at 164 samples per second. This is the data which was post-test processed to form the mean and standard deviation velocity component listings presented in Appendix B of this report. It is also the data used in developing the time history tapes of the airwake measurements for each probe. The 0.8 second model data burst is equivalent to 64 seconds of full scale real-time turbulences, according to Strouhal scaling law similarities for the 1/80 scale ship.

In addition to the standard 0.8 second data samples, long data runs (of about 10.4 seconds each) were made periodically during the test for selected conditions, duplicating those already run. These runs were intended for use in developing the airwake math model, and were processed in a manner similar to that used with the shorter samples. Along with the mean and 1 $\sigma$  standard deviation calculations, some of these long runs were also processed through the wind tunnel Fast Fourier Transform Frequency Analysis, for comparison with results of the shorter runs.

During the standard 0.8 second run, 131 data samples were recorded, or one every 0.006 seconds. This sample rate was primarily dictated by constraints of the "WINDEE" data system as influenced by the number of probe sensor signals being multiplexed, the desired range of frequency content in the final results, and the amount of data which could be reduced within the cost limitations of the contract. Assuming a minimum of 2 samples per cycle to define wave form, the data sample rate and run time used in the wake turbulence test permitted accurate measurement of frequencies between 1.25 Hz and 80 Hz (model scale).

To refer these frequencies to full scale values, Strouhal Number is assumed to be the same for the model and full size ship (since the

minimum Reynolds Number experienced in the model test exceeded  $10^3$ , which is the criteria for constancy established by Hoerner, in Reference 2). Strouhal frequency scaling laws state that:

$S = \frac{fh}{V}$  where: S is Strouhal Number (usually constant for a given body shape)  
f is the frequency of the shed vorticity  
h is a characteristic dimension of the body (normally width)  
V is the flow velocity

Based on these relationships, the full scale range of frequencies possible from the test results can be derived from model frequency data by simply dividing by the (80:1) scale factor. This division results in full scale turbulence frequencies ranging from 0.0156 Hz to 1.0 Hz, which is more than adequate for application in existing flight simulation math models for most aircraft. Scaling the recorded model time history data for simulation work requires only that the 0.006 second time-between-data samples be increased to 0.488 seconds.

## SECTION 6.0 DISCUSSION OF TEST RESULTS

As indicated in the Introduction to this report, the principal objective of the wind tunnel effort described herein was to record on magnetic tape a three component velocity time history data map of the turbulent airwake behind a DD 963 destroyer model, suitable for later application in VSTOL aircraft or helicopter design and flight simulation work. A second major program objective of the contractor was to process the time history data into computer listings of three component mean and standard deviation velocity information. These objectives were achieved successfully, along with meeting lower priority goals to develop a qualitative feel for the airwake through application of smoke and helium/soap bubble flow visualization techniques.

On the basis of having either met or exceeded the contractual objectives stated above, no attempt has been made by the contractor to exhaustively analyze the test data for math modeling purposes in this report. Rather, the data have been carefully scrutinized for validity from an aerodynamic and data analysis standpoint, and samples of the more interesting test results either plotted or presented photographically in this section. It is expected that a comprehensive evaluation leading to synthesis of an airwake math model for the DD 963 will be conducted by personnel of the NADC Flight Dynamics Branch sometime later this year.

In the review of test results presented in this section, previous ground-plane boundary layer survey information from the FF 1052 program (which applies equally well for the DD 963 test), and flow visualization studies conducted with the Spruance, are discussed first. Typical dynamic time history data presentations are covered next, followed by a description of the more interesting horizontal and vertical plane velocity vector maps plotted from the test results. Velocity maps compare the following:

- Effect of ship superstructure on variation in local flow with increasing height above the deck, in the horizontal plane
- Magnitude and directional variations in local horizontal flow caused by:
  - ship yaw angle for headwind/crosswind tests
  - ship roll angle
  - remote wind speed
- Effect of hull/superstructure shape on flow in vertical planes above and behind the flight platform
- Effect of tailwinds over the fantail
- Turbulence "roughness" as indicated by pictorial displays of longitudinal/lateral  $1\sigma$  variations about the mean velocity vector.

Data samples from selected test runs (including several of the long 10.4 second data points) were also processed through the Wind Tunnel Frequency

Analysis Program, to determine the periodic frequency content of the airwake turbulence. These results, presented in model scale plots, are quite interesting because of their implications regarding eventual math modeling of dynamic components of the airwake.

#### 6.1 GROUNDPLANE BOUNDARY LAYER SURVEY (Data from Reference 1 test of FF 1052 Frigate)

Data presented in Figure 19 compare predicted and measured boundary layer velocity gradient characteristics, at the  $\xi$  of yaw rotation under the landing platform bullseye, and on the tunnel  $\xi$  slightly forward of the DD 963 model bow. Excellent agreement between predicted and measured boundary layer thickness is shown in the figure.

For the bow (of the FF 1052) which was three feet from the groundplane leading edge, boundary layer thickness was predicted to be about 0.75 inches in depth. Actual measurements at the point where local velocity was reaching 95% of free stream, indicated a thickness varying between 0.7 and 1.1 inches above the surface. For the location of the DD 963 bow (see Figure 5 in the report Summary), predicted thickness is approximately 1.2 inches.

Along the groundplane at the  $\xi$  of yaw rotation (which was the same for both models), boundary layer thickness was predicted to have grown to slightly over two inches. At 95%  $U$ , the actual groundplane  $U_{\infty}$

measurement put the boundary layer height for 50 and 20 knots free stream tunnel velocity, at 1.7 and 2.5 inches respectively. Estimated boundary layer thickness at the location of the DD 963 fantail is just under three inches, and at the aft end of the groundplane behind the ship slightly less than 4.5 inches.

The thrust of these earlier test results indicates that the 2 inch adapter skirt used for mounting the DD 963 hull, placed the top of the boundary layer at about the level of the ship waterline amidships, and roughly 3/4 inch above the waterline at the fantail. For the full scale vessel, the free stream boundary layer at sea will probably be a bit higher along the hull than the thicknesses just described (Reference 11); but the at sea boundary thickness data is rather sparse and somewhat subjective in nature; and, of course, is heavily dependent on sea state (which is a function of wind and wave height).

Despite the likely difference in model and full scale boundary layer thicknesses over the length of the ship, turbulence levels measured behind and above the superstructure are probably unaffected by not exactly matching the boundary layer heights along the sides of the vessel. More importantly, aft of the ship where the groundplane boundary growth is substantial (unlike what happens at sea, where it tends to remain at a constant height for given wind and wave conditions), the match in model and full scale velocity gradient depth is somewhat closer. Boundary layer thickness aft of the ship becomes more significant than the portion adjacent to the hull, because the



DATA FROM FF1052 SHIP WAKE TURBULENCE TEST BVWT 183

NOTES:

- (1) MOUNTED 14 IN. ABOVE TUNNEL FLOOR
- (2) 20 FT. X 20 FT. GROUNDPLANE
- (3) HOERNER-SECT 2-3

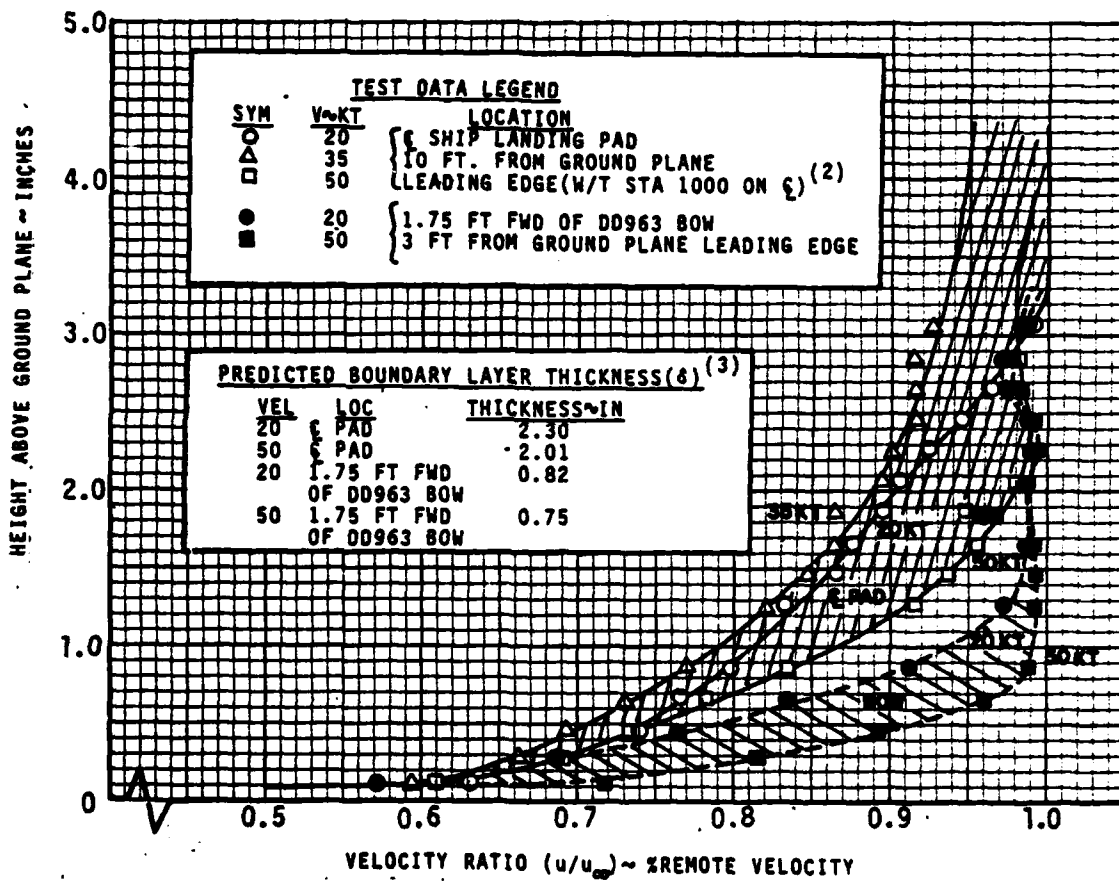


Figure 19. BOUNDARY LAYER SURVEY ABOVE FIXED BVWT GROUNDPLANE

character of the aerodynamic wake may be altered by its reflection from the simulated water surface.

Since the relationship between the waterline and boundary layer depth behind the ship was probably as close as it could have been during the test, it is concluded that the ship was mounted properly to simulate its aerodynamic wake.

## 6.2 FLOW VISUALIZATION TESTS

Highlights of the smoke and soap bubble flow visualization work described in Section 5.3 are summarized in the photographs presented in Figures 20 through 23. Graphically illustrated on these still photographs are major areas of turbulence and vorticity identified in the airwake surrounding the DD 963 hull and superstructure. As indicated earlier, the smoke tests verified probe positioning on the rake (both in the horizontal and vertical planes) from observations made in the tunnel.

From above, smoke trajectory indicated that as the ship yawed, flow tended to entrain itself behind the hull parallel to its centerline, and then straighten again as it approached the stern of the vessel. This observation confirmed earlier Boeing testing with the FF 1052, and results from smoke tests of a 1/200 scale DD 963 in the Princeton University Forrestal Research Center 3 x 4 foot tunnel, sponsored by NAEC last year.

The significant conclusion of all of this work is that the hull behaves almost exactly like a heavily loaded low aspect ratio wing (sticking up out of the water), which sheds a powerful vortex as shown clearly in the 30° and 50° right yaw photos in Figures 20 and 21. In the Princeton tunnel, the "tip" vortex was viewed from directly aft of the ship where the mechanization of the flow patterns becomes somewhat easier to understand, as opposed to being viewed from above, or to the side, as in the BWVT 182 and 242/243 tests.

As shown in Figure 20, the hull seems to "stall" somewhere between 30° and 50° of yaw (or  $\alpha$ , if one considers the wing analogy), and downstream flow becomes disorganized and jumbled. At 90° yaw, reverse flow amidships is observed, while flow over bow and stern areas is still in a downstream direction. Color movies clearly show the dynamics of the various vortex and turbulent airflow patterns, for ship yaw angles from 0° to 180°.

Unlike the smoke studies which identified large scale "macroscopic" flow patterns around the hull, the helium-soap bubble tracks did the "micro" job in and around various elements of superstructure as shown in Figures 22 and 23. As expected, a strong bound vortex was discovered in the lee of the hangar over the landing platform. This recedes rather quickly into a jumbled, disorganized pattern when ship yaw angles exceed 10° to 15° in either direction. The expected "spoiler like" action of the asymmetrically placed aft stack on top of the

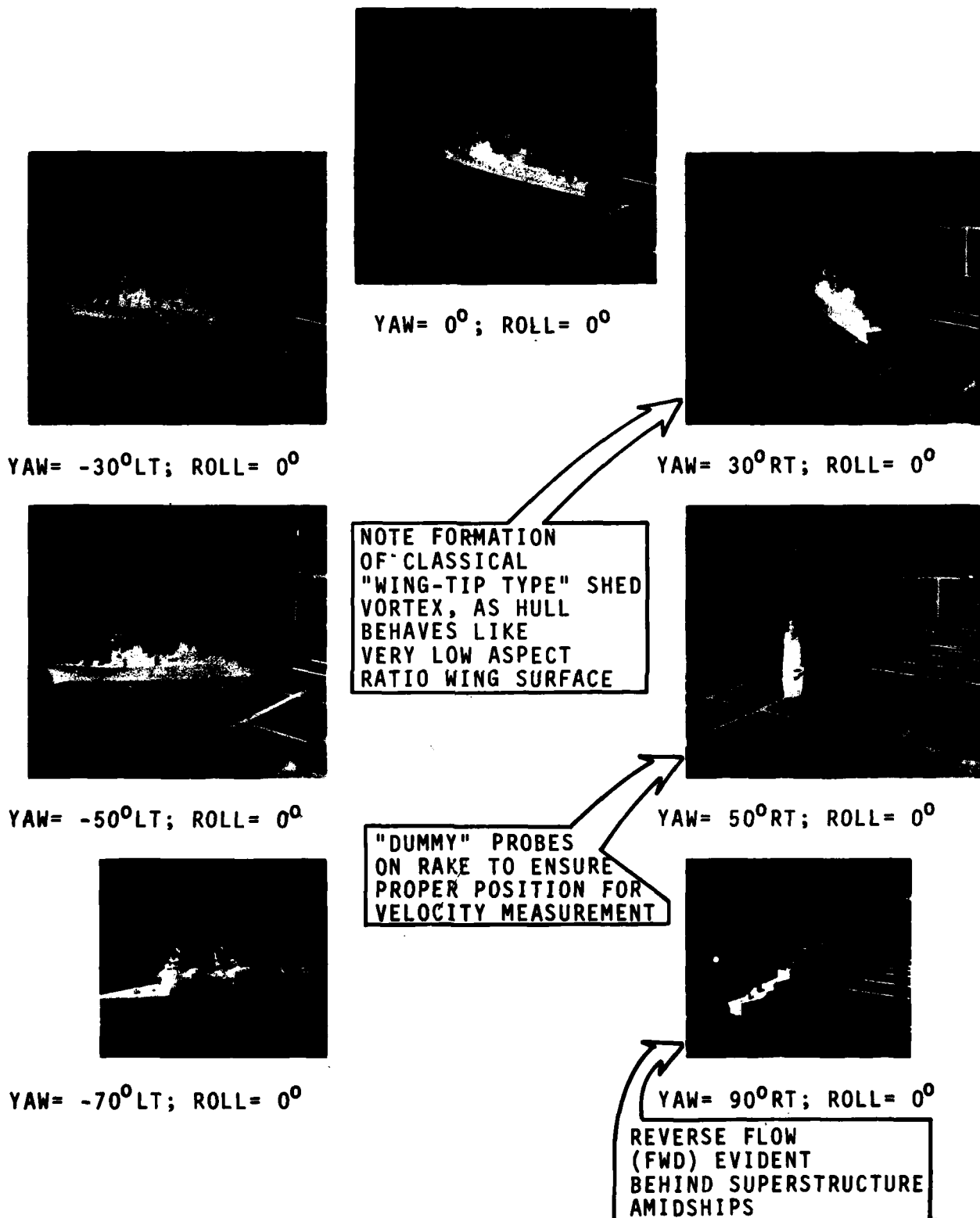


Figure 20. SMOKE FLOW PATTERNS AROUND HULL AS SHIP IS YAWED LEFT AND RIGHT TO REMOTE FLOW.

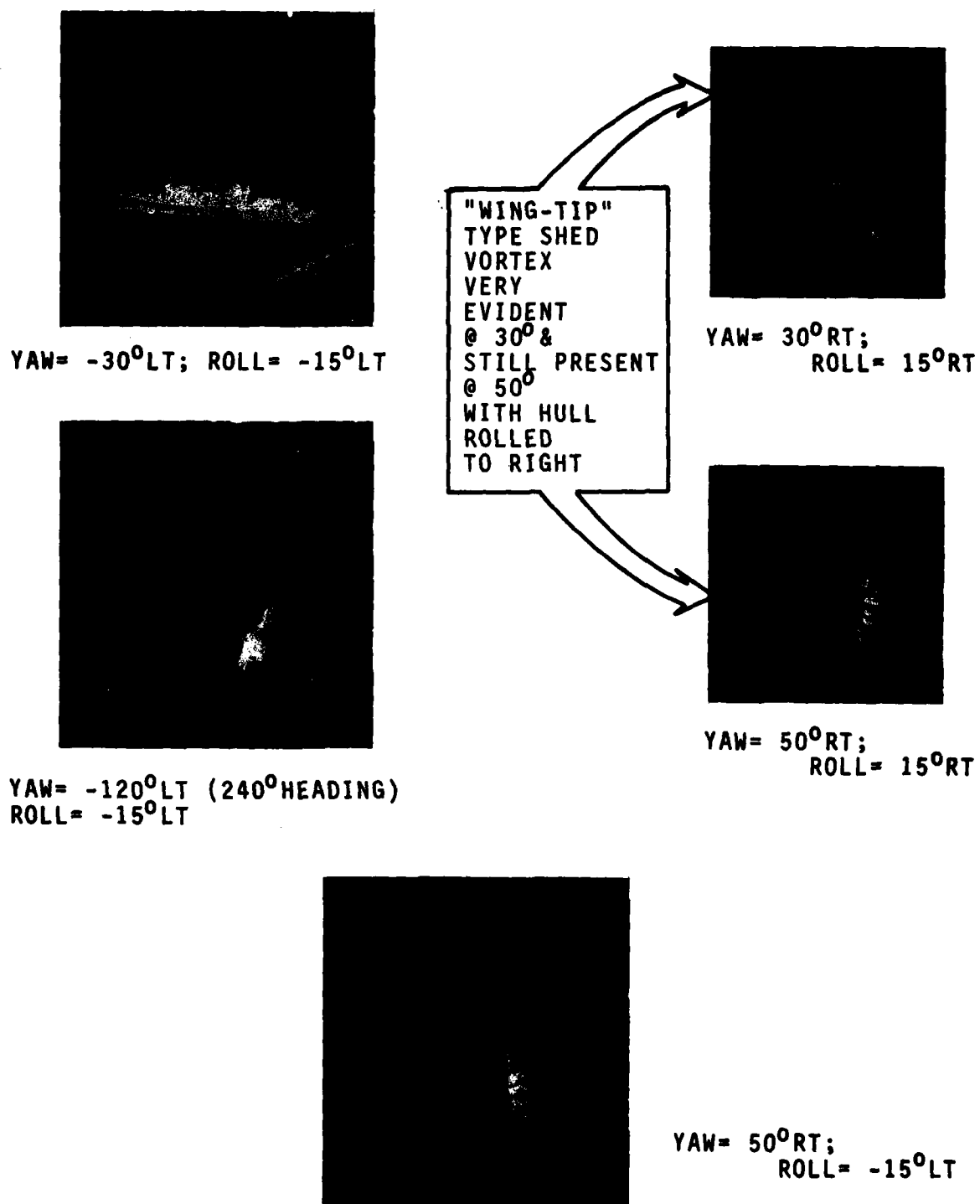
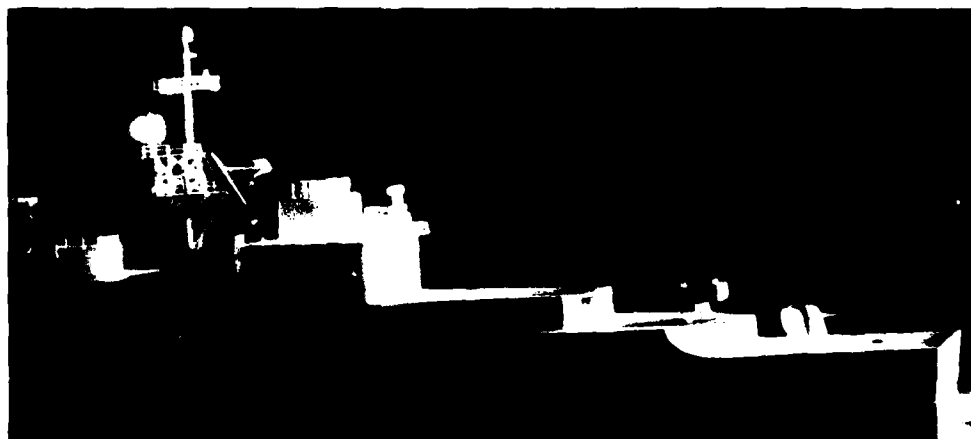
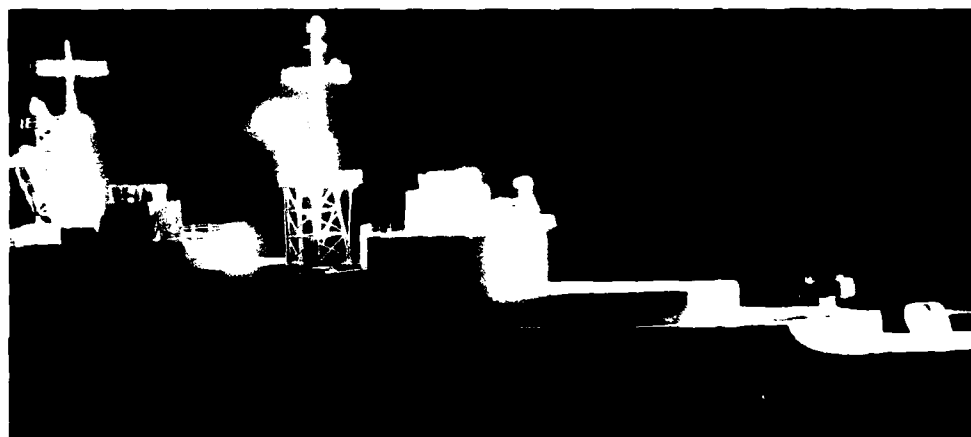


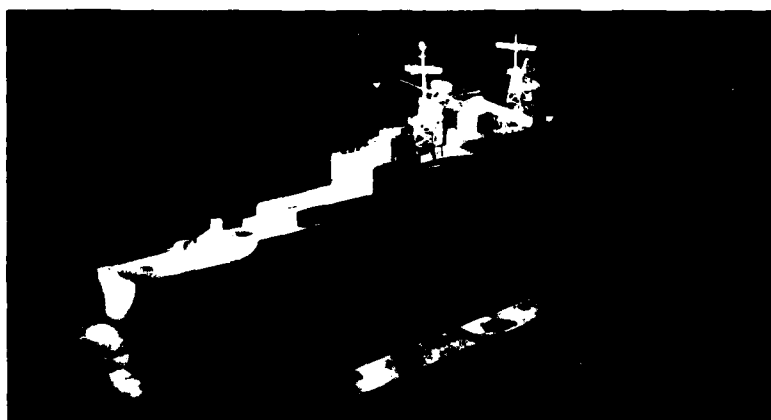
Figure 21. EFFECT OF HULL ROLL ANGLE ON FLOW AROUND VESSEL.



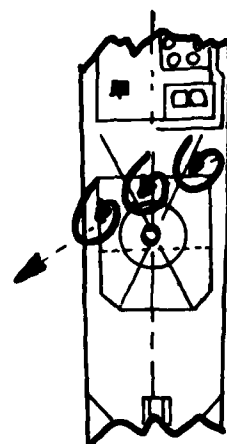
BOUND VORTEX BEHIND HANGAR OVER LANDING DECK,  
HELD FORWARD AND TO THE CENTER OF HANGAR



NOZZLE HELD FWD OF BRIDGE - SHOWING FLOW AFT OF MAST  
STRUCTURES & BOUND VORTEX BEHIND HANGAR AGAIN



SUCK DOWN OF HIGH LEVEL FLOW AFT OF  
SUPERSTRUCTURE @ 0° YAW

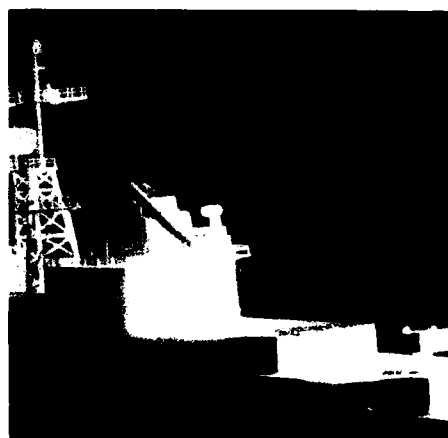


NOTE:  
BOUND  
VORTEX  
SLIGHTLY  
SKEWED  
ACROSS  
DECK @ 0°  
YAW  
BECAUSE  
OF STACK  
OFFSET  
ON HANGAR  
TOP

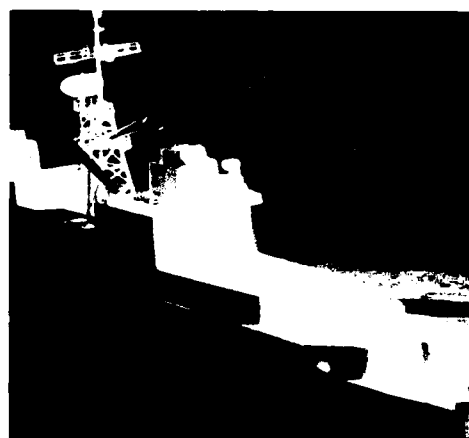
Figure 22. HELIUM-SOAP BUBBLE FILAMENT TRACKS INDICATING  
FLOW FIELD AROUND SHIP SUPERSTRUCTURE @ 0° YAW



YAWING SHIP IN EITHER DIRECTION BREAKS UP BOUND VORTEX  
OVER LANDING DECK INTO ROUGH SOMEWHAT INCOHERENT FLOW  
PATTERNS (30° RT SHOWN)

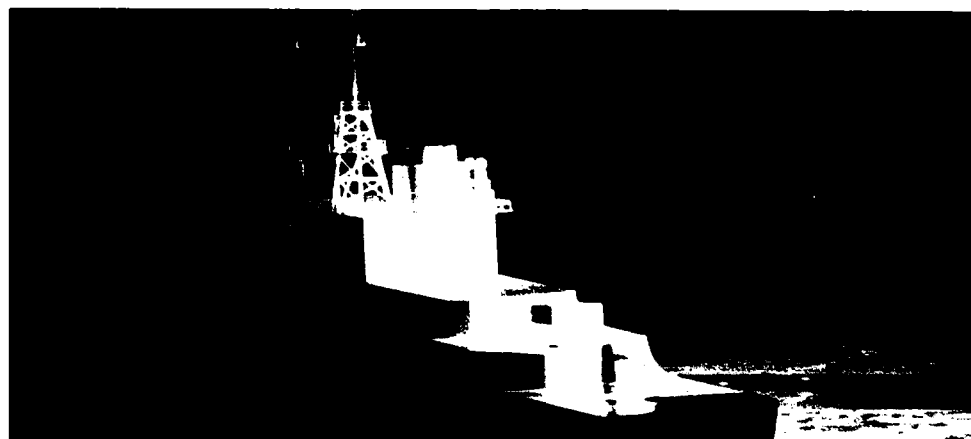


30°  
RT



50°  
RT

ROUGH FLOW BEHIND HANGAR WITH SHIP YAWED TO REMOTE WIND



EXCELLENT PHOTO OF EXTREME TURBULENCE IN LEE OF AFT STACK  
WITH SHIP @ 50° RT YAW - NOTE LARGE NUMBER OF MINI-VORTICES  
MAKING UP FLOW PATTERN

Figure 23. HELIUM - SOAP BUBBLE FILAMENT TRACKS  
INDICATING TURBULENT FLOW FIELD WITH SHIP YAWED

hangar, apparently contributed to breaking up the bound vortex as flow passed obliquely over the hangar roof.

Another observation from the bubble studies was that the mast structures (consisting of numerous cross braces, wires etc.) tend to act as large flow screens (similar to those found in wind tunnels), which break the flow into minute "mini-vortices", and thus contribute to the apparent incoherent flow behind the ship when yawed. Despite appearances to the contrary in the flow viz work, the overall flow field behind the ship has a very repeatable steady component at most yaw angles and locations throughout the wake, as will be shown later in the velocity vector maps.

### 6.3 RESULTS OF TURBULENT AIRWAKE VELOCITY MAPPING

6.3.1 Time History Data - As described in the Test Procedure and Conditions Section, computer processed time histories of three component velocity data were stored on magnetic tape for all test points taken during the wake turbulence program. Two data tapes were generated:

- The first tape includes all test points; with the run, test point and probe designations added for identification only. Full interpretation of this tape requires use of the Test Run Log (Appendix A), and Table 3 presented in Appendix B.
- A second edited tape has duplicate or repeat runs and yaw sweeps removed; but includes a complete description of the run, test point, probe, tunnel velocity, hull roll angle, and full scale location for each probe relative to the ship annotated. This is the tape utilized for data listings presented in Appendix B.

Vx, Vy and Vz time history data are expressed in meters per second on the tapes, and likewise all other processed data listings etc. utilize metric units throughout as required by the contract. The interval between data samples on the time history tapes recorded during the test is 0.006 seconds. Correction of the data to full scale requires only an expansion of the time between data samples to 0.488 seconds as discussed in Section 5.5. It should be noted that the test was conducted in the range of full scale wind velocities desired, and requires no Reynolds Number scaling corrections. The minimum test velocity produced Reynolds Numbers on the order of  $1.2 \times 10^6$  for the hull in the area of the landing pad and  $2.0 \times 10^5$  for major elements of superstructure; both of which are well above requirements for maintaining constant Strouhal Number, and adequate for ensuring supercritical flow over most of the ship.

Figure 6 in the report summary illustrates the type of time history data stored on tape for a typical 20 knot 0.8 second run. Also shown are results of processing the data to derive mean and 1 $\sigma$  Standard Deviation velocity component information for the listings in Appendix B. Information presented in the figure was

computer generated for a single  $V_x$  velocity component from information such as that listed in Figure 24, which is a digital printout of all 131 data points for each of the three velocity components for Run 9, test point 2, at 30° right yaw. Information presented in Figure 25 summarizes mean and 1 $\sigma$  processing results for the same run, with additional test points at 0° and 50° yaw. The data format of Figure 25 is followed in Appendix B.

Figures 26 and 27 compare time histories of 0.8 and 10.4 second runs; representing the same 45 knot test condition, and computer plotted on a compressed time scale when compared to Figure 6. Note that mean and standard deviation values computed for these two runs are virtually identical, indicating that the shorter data run does, in fact, represent average conditions existing in the wake at any one time. Also of interest is the size of the 1 $\sigma$  variation about the mean, which is about 50% of the steady value for the probe located just aft of the hangar corner in the vicinity of the landing area bound vortex.

It is interesting to observe that the 6.6 M/Sec steady mean velocity at this location is reduced substantially, when compared to the free stream 23 M/Sec (45 knot) value. This reduction in local "q" behind the hangar, and large value for standard deviation are both indicative of the levels of flow separation and turbulence present in the airwake field aft of the ship. Areas of disturbed and separated flow are graphically demarcated in the velocity maps presented next.

6.3.2 Steady State Velocity Maps - Mean (or average) velocity data of the type presented in the Figure 25 printout (and listed for the entire test program in Appendix B), were used to generate steady-state velocity vector maps for horizontal and vertical planes above the deck of the ship. Horizontal plane information has been developed for:

- Minimum height above the landing deck
- Hangar roof top height
- Stack uptake height
- Radar antenna height in the mast superstructure

Additional maps have been plotted which depict flow in the six vertical planes (corresponding to the lateral probe locations) running behind and parallel to the ship; starting at the landing platform centerline, and working rearward to one ship length aft of the bullseye.

$V_x$  and  $V_y$  data were summed vectorially (for map presentation) to produce the resultant horizontal velocity at each probe location in the desired plane. The same was true of  $V_x$  and  $V_z$  data, which were summed for the vertical flow presentations. All information plotted in these vectorial depictions of the airwake was developed from the 0.8 second "standard length" runs made during the test. Results of analyzing data from the longer runs are discussed later.





8WV 242/243 SHIP WAKE TURBULENCE TEST

9 10.2	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
1	0.0	1	0.0	1	0.00	-6.60	6.22	0.21932E 01	0.90000E 01	-0.36400E 00	0.17144E 01	0.14972E 01	0.16990E 01
2	0.0	2	0.0	2	0.00	0.00	6.22	0.21932E 01	0.16700E 01	-0.02200E 00	0.17144E 01	0.14972E 01	0.16990E 01
3	0.0	3	0.0	3	0.00	0.00	6.22	0.21932E 01	0.13950E 01	0.07400E 00	0.17144E 01	0.14972E 01	0.16990E 01
4	0.0	4	0.0	4	0.00	0.00	6.22	0.21932E 01	0.13950E 01	0.07400E 00	0.17144E 01	0.14972E 01	0.16990E 01
5	0.0	5	0.0	5	0.00	0.00	6.22	0.21932E 01	0.13950E 01	0.07400E 00	0.17144E 01	0.14972E 01	0.16990E 01
6	0.0	6	0.0	6	0.00	0.00	6.22	0.21932E 01	0.13950E 01	0.07400E 00	0.17144E 01	0.14972E 01	0.16990E 01
7	0.0	7	0.0	7	0.00	0.00	6.22	0.21932E 01	0.13950E 01	0.07400E 00	0.17144E 01	0.14972E 01	0.16990E 01
8	0.0	8	0.0	8	0.00	0.00	6.22	0.21932E 01	0.13950E 01	0.07400E 00	0.17144E 01	0.14972E 01	0.16990E 01
9	0.0	9	0.0	9	0.00	0.00	6.22	0.21932E 01	0.13950E 01	0.07400E 00	0.17144E 01	0.14972E 01	0.16990E 01
10	0.0	10	0.0	10	0.00	0.00	6.22	0.21932E 01	0.13950E 01	0.07400E 00	0.17144E 01	0.14972E 01	0.16990E 01
1	0.0	1	0.0	1	0.00	-6.60	6.22	0.21932E 01	0.47050E 00	0.28360E 01	0.35780E 01	0.10490E 01	0.45740E 01
2	0.0	2	0.0	2	0.00	0.00	6.22	0.21932E 01	0.10750E 01	-0.12600E 00	0.35780E 01	0.10490E 01	0.45740E 01
3	0.0	3	0.0	3	0.00	0.00	6.22	0.21932E 01	0.25910E 00	-0.06300E 00	0.35780E 01	0.10490E 01	0.45740E 01
4	0.0	4	0.0	4	0.00	0.00	6.22	0.21932E 01	0.25910E 00	-0.06300E 00	0.35780E 01	0.10490E 01	0.45740E 01
5	0.0	5	0.0	5	0.00	0.00	6.22	0.21932E 01	0.25910E 00	-0.06300E 00	0.35780E 01	0.10490E 01	0.45740E 01
6	0.0	6	0.0	6	0.00	0.00	6.22	0.21932E 01	0.25910E 00	-0.06300E 00	0.35780E 01	0.10490E 01	0.45740E 01
7	0.0	7	0.0	7	0.00	0.00	6.22	0.21932E 01	0.25910E 00	-0.06300E 00	0.35780E 01	0.10490E 01	0.45740E 01
8	0.0	8	0.0	8	0.00	0.00	6.22	0.21932E 01	0.25910E 00	-0.06300E 00	0.35780E 01	0.10490E 01	0.45740E 01
9	0.0	9	0.0	9	0.00	0.00	6.22	0.21932E 01	0.25910E 00	-0.06300E 00	0.35780E 01	0.10490E 01	0.45740E 01
10	0.0	10	0.0	10	0.00	0.00	6.22	0.21932E 01	0.25910E 00	-0.06300E 00	0.35780E 01	0.10490E 01	0.45740E 01
1	0.0	1	0.0	1	0.00	-6.60	6.22	0.21932E 01	0.15150E 01	0.30290E 01	0.73220E 01	0.12290E 01	0.65940E 01
2	0.0	2	0.0	2	0.00	0.00	6.22	0.21932E 01	0.15150E 01	0.30290E 01	0.73220E 01	0.12290E 01	0.65940E 01
3	0.0	3	0.0	3	0.00	0.00	6.22	0.21932E 01	0.15150E 01	0.30290E 01	0.73220E 01	0.12290E 01	0.65940E 01
4	0.0	4	0.0	4	0.00	0.00	6.22	0.21932E 01	0.15150E 01	0.30290E 01	0.73220E 01	0.12290E 01	0.65940E 01
5	0.0	5	0.0	5	0.00	0.00	6.22	0.21932E 01	0.15150E 01	0.30290E 01	0.73220E 01	0.12290E 01	0.65940E 01
6	0.0	6	0.0	6	0.00	0.00	6.22	0.21932E 01	0.15150E 01	0.30290E 01	0.73220E 01	0.12290E 01	0.65940E 01
7	0.0	7	0.0	7	0.00	0.00	6.22	0.21932E 01	0.15150E 01	0.30290E 01	0.73220E 01	0.12290E 01	0.65940E 01
8	0.0	8	0.0	8	0.00	0.00	6.22	0.21932E 01	0.15150E 01	0.30290E 01	0.73220E 01	0.12290E 01	0.65940E 01
9	0.0	9	0.0	9	0.00	0.00	6.22	0.21932E 01	0.15150E 01	0.30290E 01	0.73220E 01	0.12290E 01	0.65940E 01
10	0.0	10	0.0	10	0.00	0.00	6.22	0.21932E 01	0.15150E 01	0.30290E 01	0.73220E 01	0.12290E 01	0.65940E 01

Figure 25. CALCULATED MEAN AND 1σ STANDARD DEVIATION VELOCITY COMPONENTS



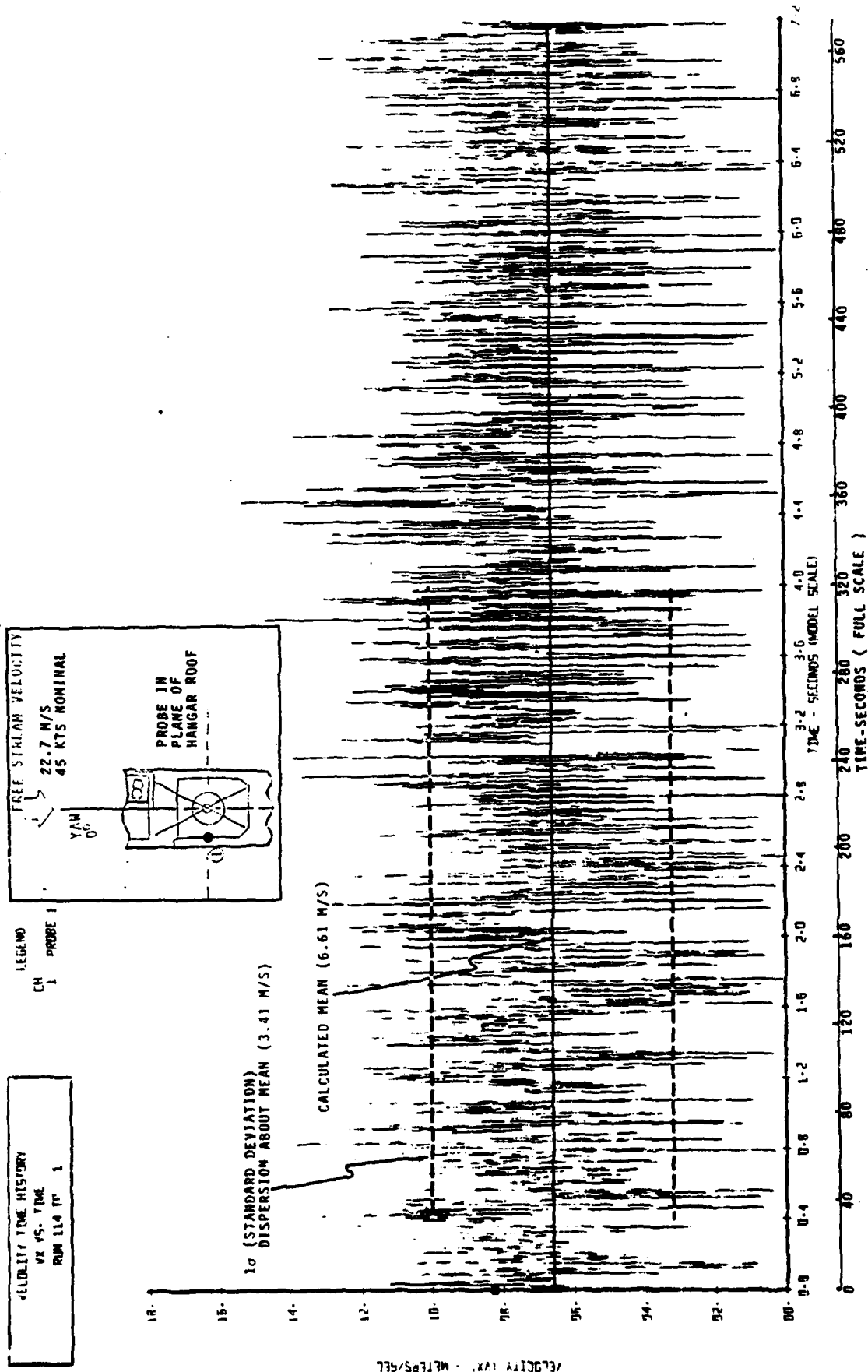


Figure 27. TYPICAL VELOCITY TIME HISTORY FOR 10.4 SECOND RUN

#### BASIC HORIZONTAL FLOW DEPICTION (with ship at 0° yaw)

Figures 28 through 30, and Figure 7 in the Summary depict steady flow field characteristics at various heights above the landing platform behind the ship superstructure. Test results at 20 knots (10.3 meters per second) remote wind (tunnel) speed, show somewhat more flow separation behind the hangar than was observed earlier with the FF 1052 frigate. Wind-over deck measurements just above the landing platform (at the 2.54 M level) indicate less than 1/3 remote velocity, and this "q" hole persists almost to the fantail. Similar characteristics are seen at hangar roof height, and not until the stack level is reached (Figure 29) does the flow begin to recover dynamic pressure.

It is interesting to note some aerodynamic effects resulting from the large aft stack structure on the right hand side of the hangar roof (as shown in the first three rows of probes in Figure 29). Reduced "q" is apparent along and behind the right hand corner of the hangar roof, until well aft of the fantail. Soap-bubble photos indicated that the rounded corner stack shape produced a very choppy Von-Karman vortex street directly behind this structure, and the slight observed reduction in dynamic pressure is apparently related to the downwind passage of the vortex cores.

Another significant observation of the 0° yaw flow field is more subtle than those just discussed; but important as will be seen later in the "tailwind" data. This is the very slight counterclockwise skewing of the outboard flow vectors throughout most of the flow field, as height is increased above the deck. Comparisons of Figures 28, 7, 29, and 30 show that the flow on either side of the ship is organized essentially parallel to a line drawn through the stack centerlines, which are on opposite sides of the hull.

When this slight amount of lateral skewing was first observed, a misalignment of flow in the tunnel test section was suspected. Run 46, made with the model removed from the tunnel, disproved this hypothesis. It would seem reasonable to attribute this cocked flow alignment with the hull at 0° yaw, therefore, to the stack asymmetry. In fact, the stacks probably act as flow directors warping the field at some distance from the hull.

#### EFFECT OF YAW ON FLOW (at low yaw angles)

Figures 31, 32, 34 and 35 compare 20 knot right and left yaw runs for various heights, with the ship oriented 30° to the remote flow. By placing the transparent overlay of the ship stored in the back of the report on the map (so that it is aligned with the hull sketch on the plot), some idea can be gained as to which piece of superstructure produces the observed changes in measured flow magnitude and direction. Dynamic pressure reduction behind the DD 963 hull and hangar is again somewhat greater than observed for the FF 1052. A comparison of Figure 32 with Figure 33 (which was taken from the FF 1052 report), shows this effect to be particularly noticeable at hangar roof height, which both figures represent.

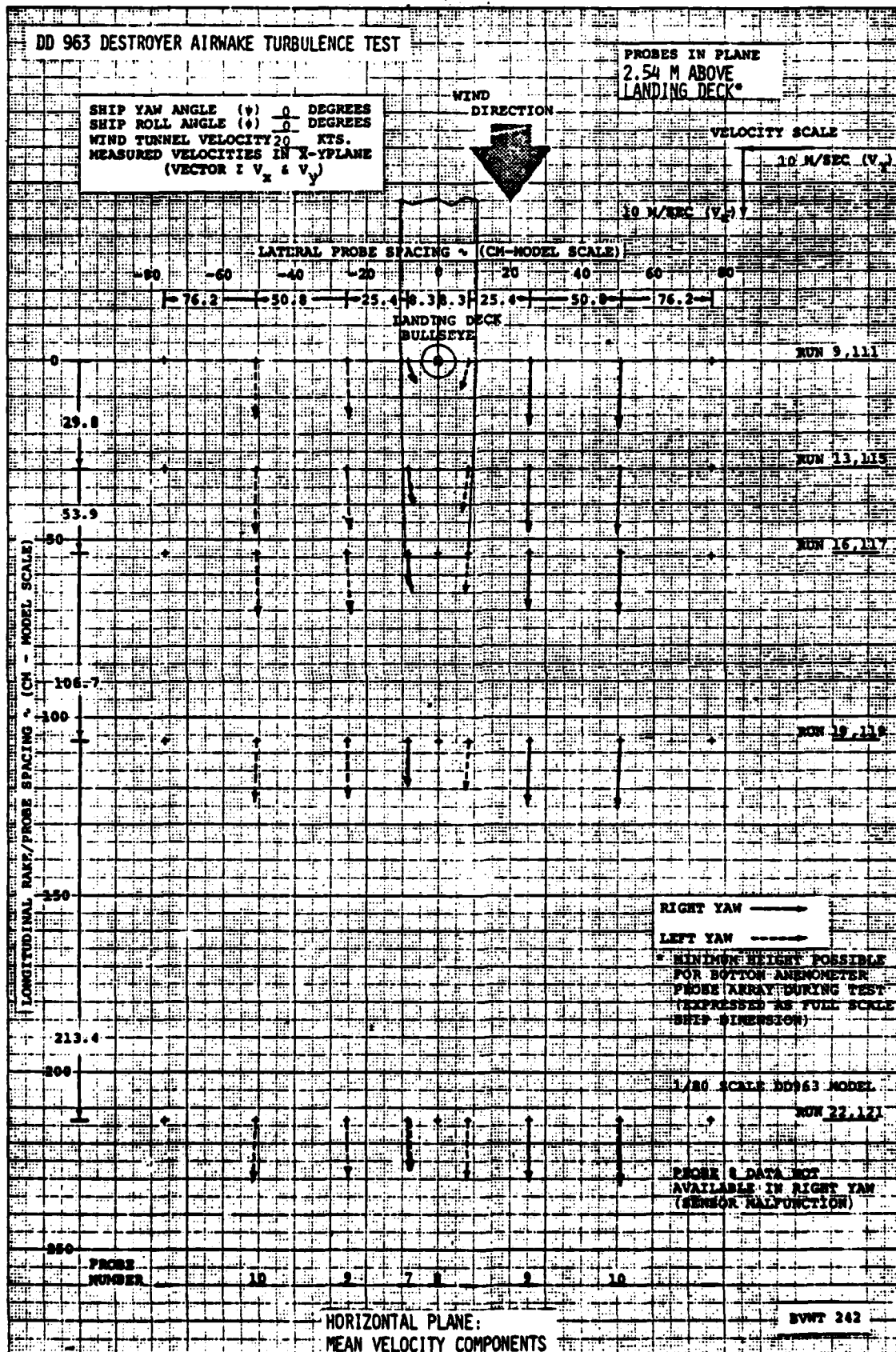


Figure 28.

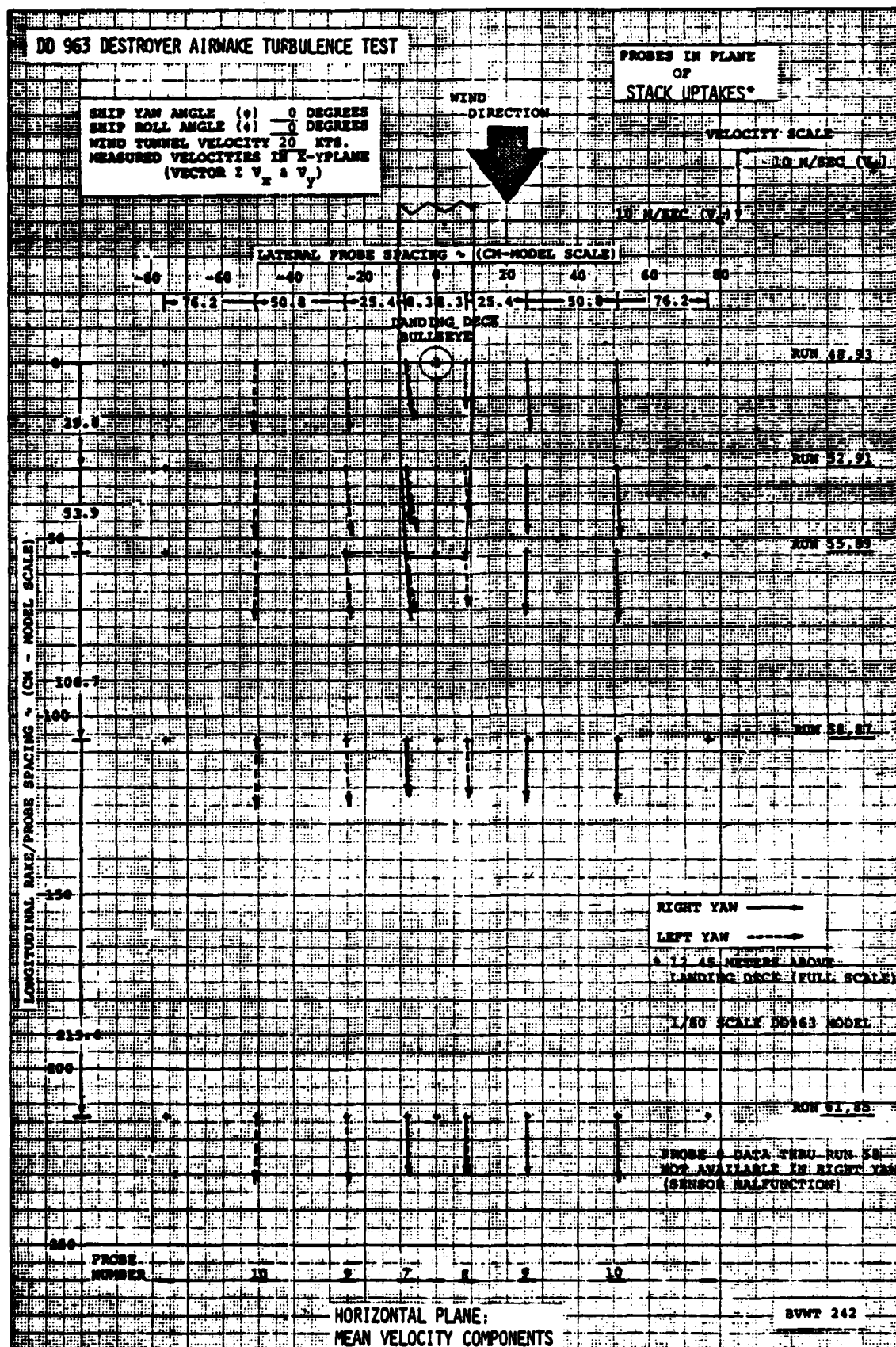


Figure 29.



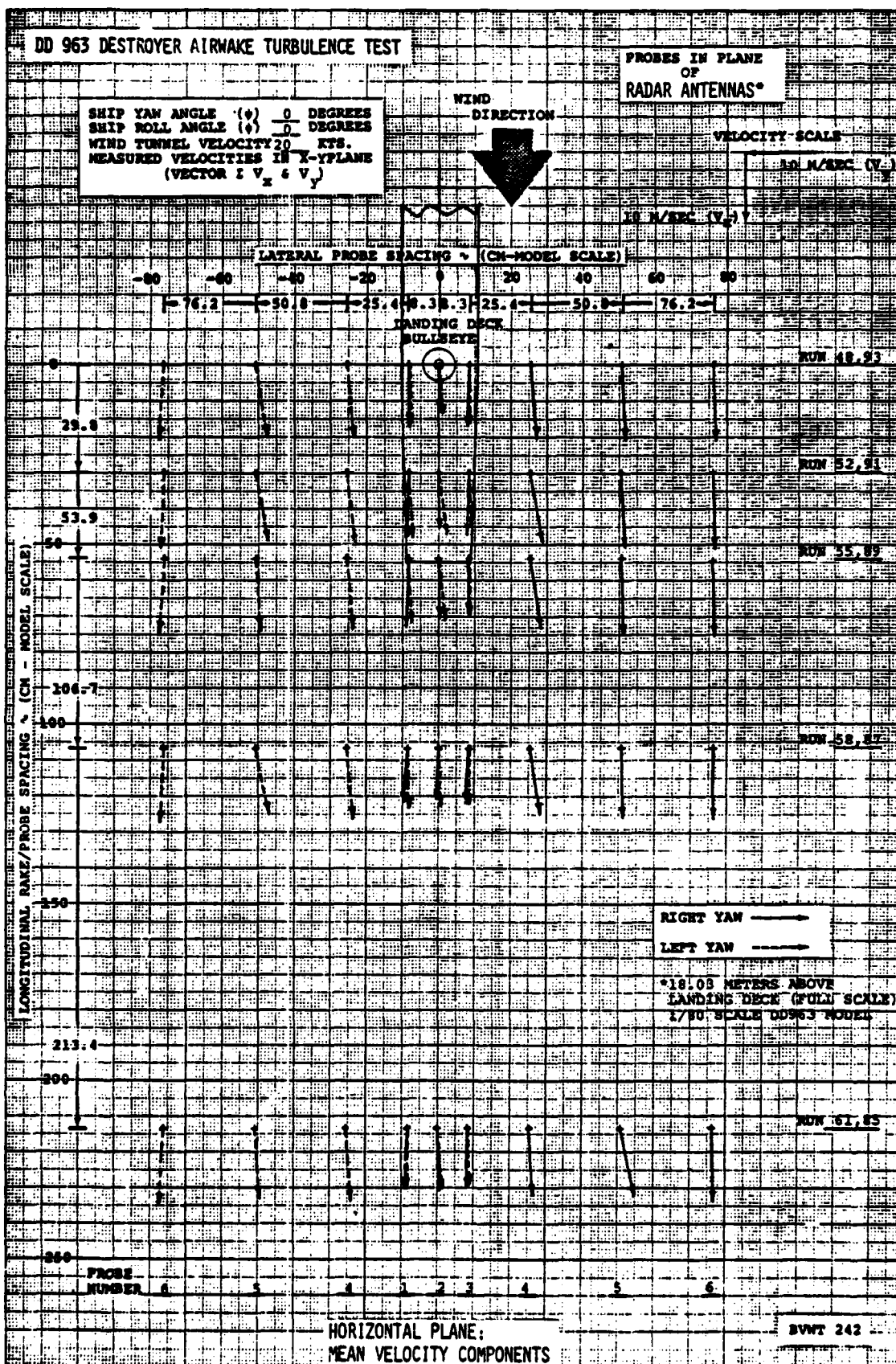


Figure 30.  
 70



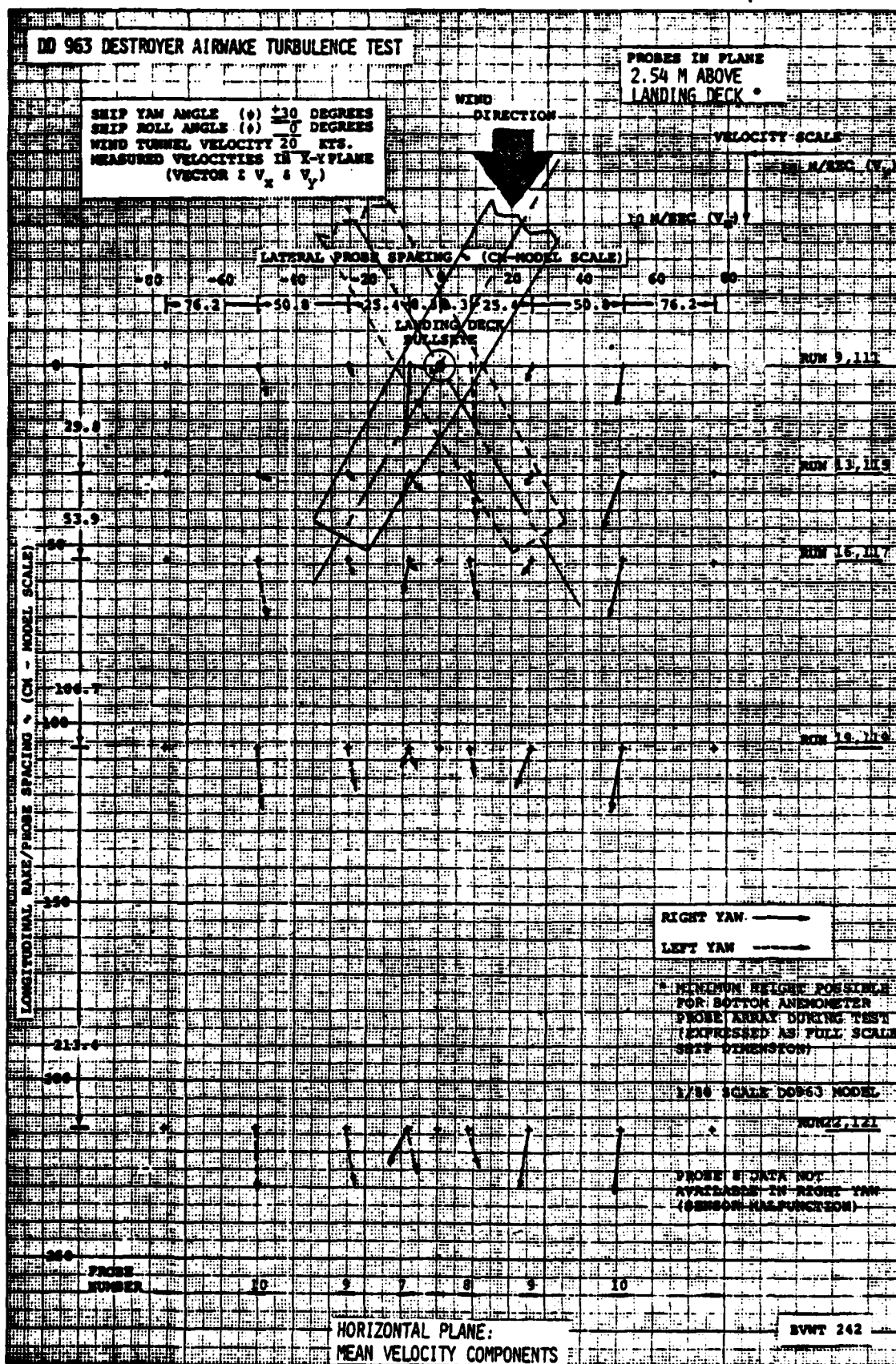


Figure 31.

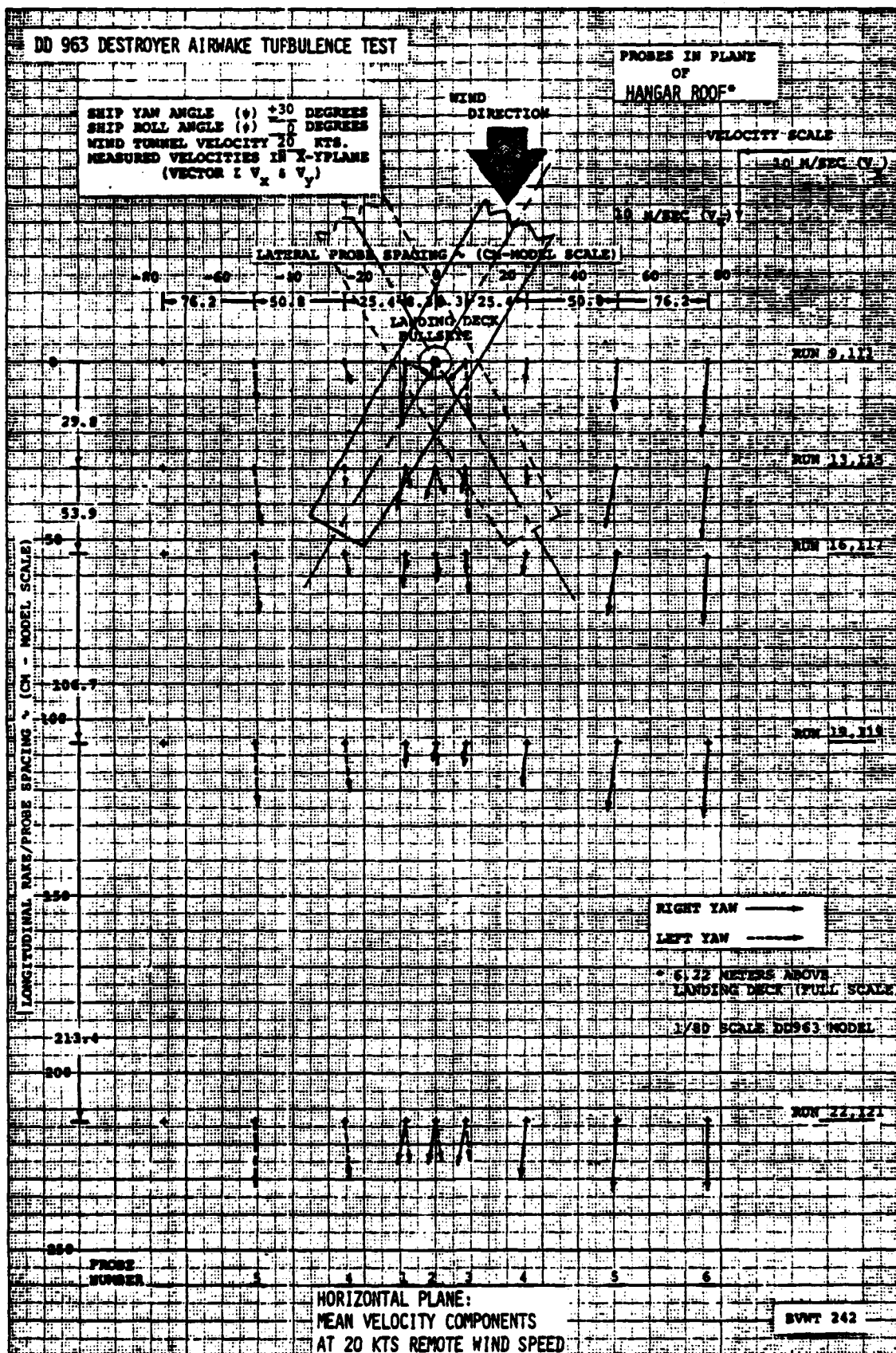
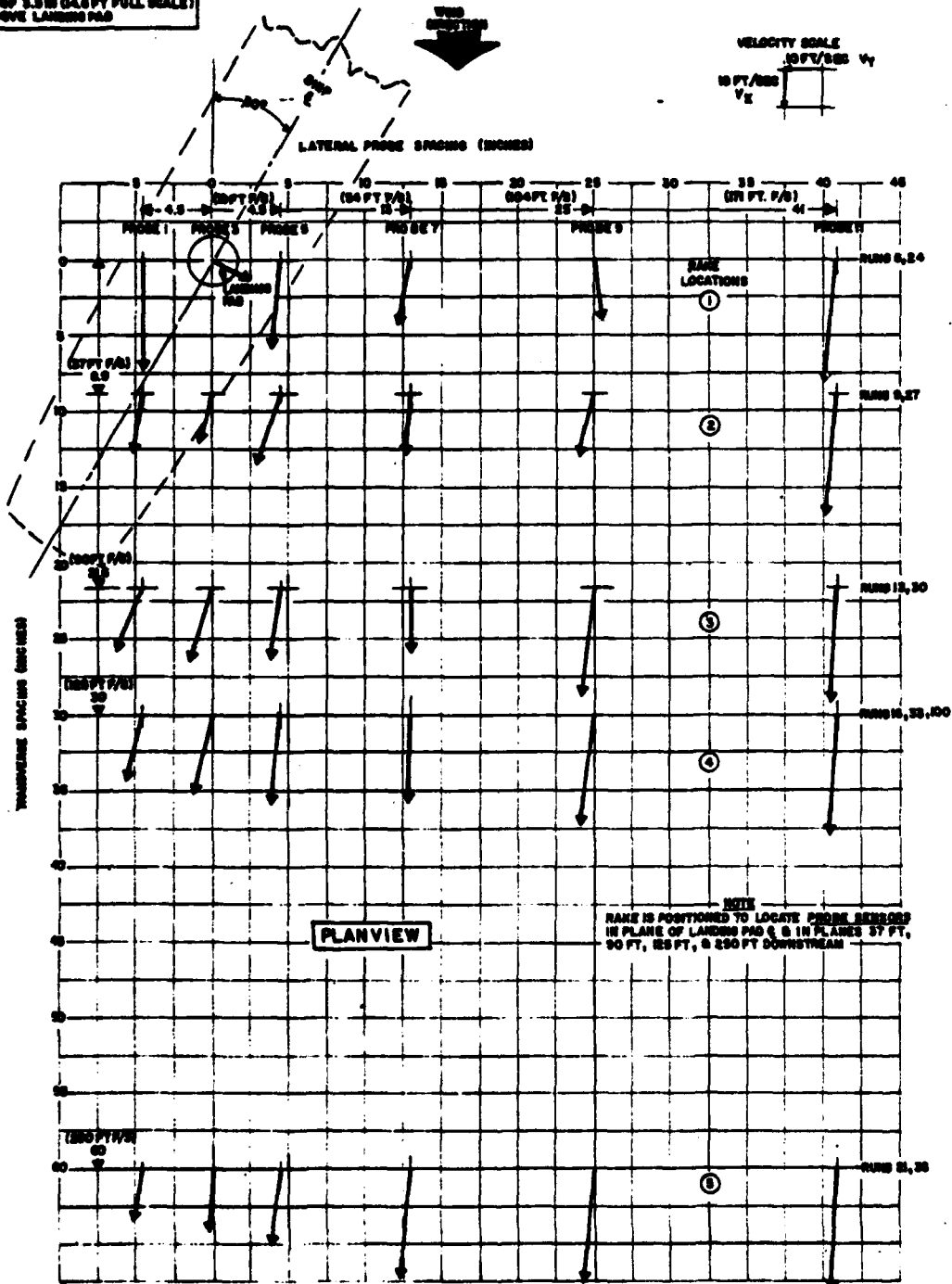


Figure 32.

DE 1052 SHIP WAKE TURBULENCE TEST - BVWT 183  
HORIZONTAL PLANE STEADY VELOCITY DISTRIBUTION

SHIP YAW ANGLE ( $\psi$ ) 30 DEG, ROLL 0 DEG  
WIND TUNNEL VELOCITY 20 KT NOMINAL  
MEASURED VELOCITIES IN X-Y PLANE  
(VECTOR  $\Sigma V_x, \Sigma V_y$ )

PROBE IN PLANE OF HANGAR  
ROOF 3.5 IN (0.45 FT FULL SCALE)  
ABOVE LANDING PAD



Horizontal Plane Steady Velocity Distribution at 30 Degrees Ship Yaw  
Angle and 20 Knots Wind Tunnel Velocity at Hangar Top Height

Figure 33. COMPARATIVE PLOT FROM FF1052 REPORT (Reference 1)

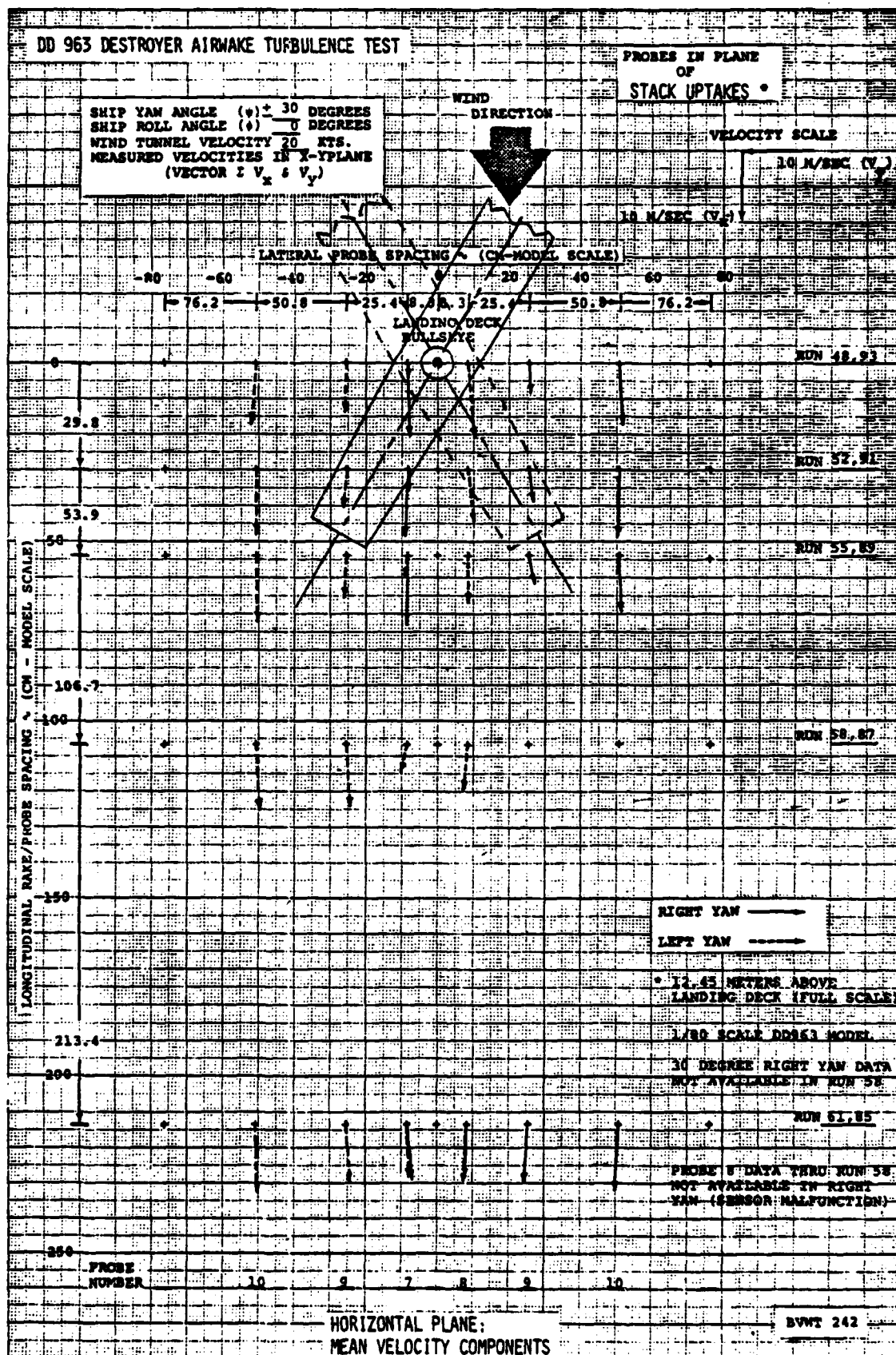


Figure 34.

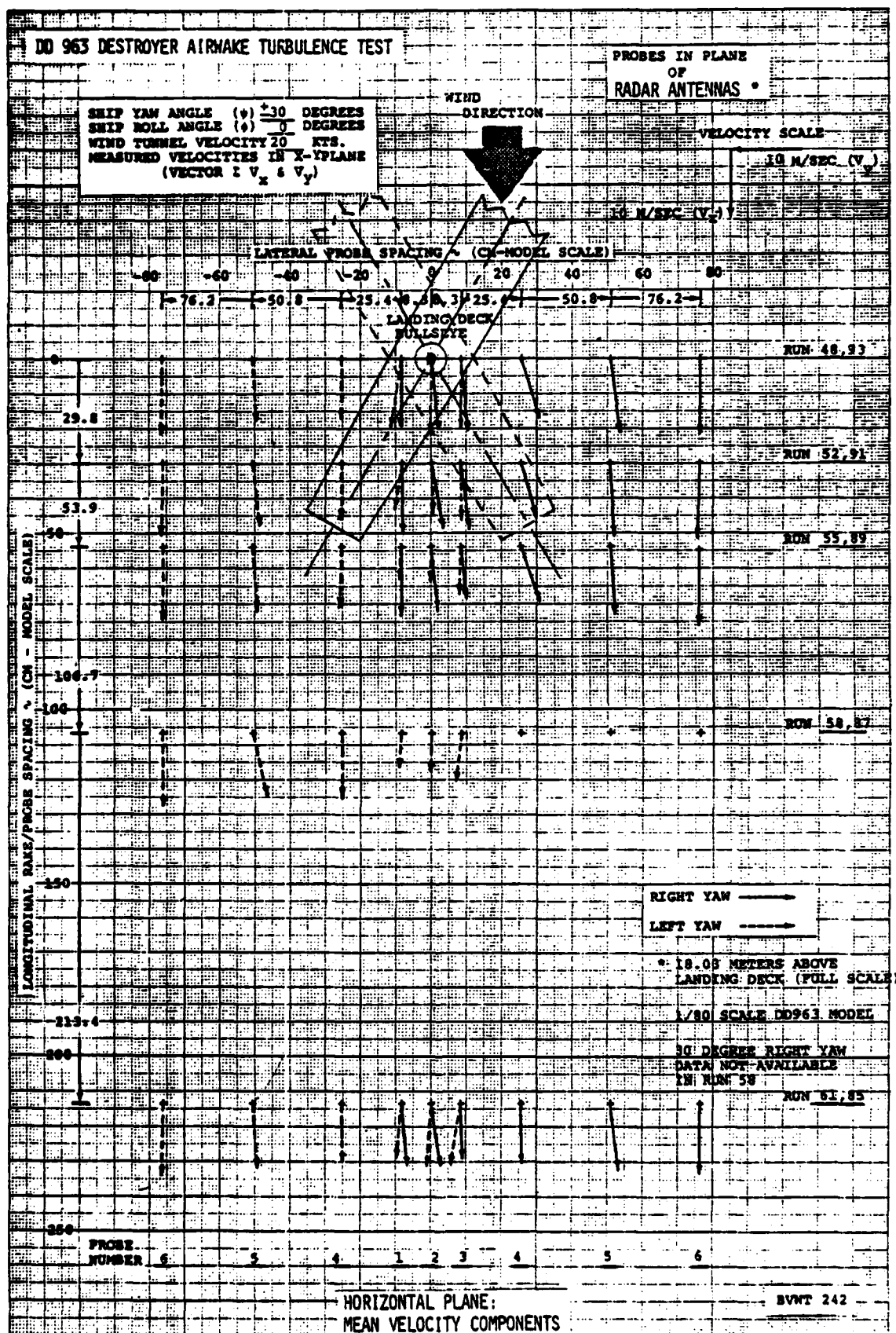


Figure 35.

Also seen in Figures 31 and 32 is a skewing of the low "q" separated flow across the landing platform, just as was observed in the Figure 22 sketch, and in the soap-bubble tests.

Both right and left yaw data are plotted on the same map to illustrate differences in flow created by the stack asymmetry. Except for the area directly behind the aft right hand stack, right and left yaw flow fields look about the same. To assist in picturing how the flow field changes with height, Figure 10 in the Summary compares all four levels for a 30° left yaw run. Most of the flow skewing observed on the plot is due to a corkscrewing of the shed vortex sheet above and behind the hull, which is clearly seen in the smoke flow visualization work illustrated in Figures 20 and 21.

Summary Figure 12 gives an indication of flow roughness with model yawed 30° right; as indicated by the 1σ variation ellipse plotted around the mean velocity vectors.

#### EFFECT OF HIGH YAW ANGLES

Figures 36 and 37 depict hangar roof level flow at +50° and +90°, respectively. Very deep flow separation at these yaw angles was observed during the flow vis study with smoke, and the measured velocity data shows the same thing. Hangar level 20 knot maps indicate many areas where flow has virtually stopped, or has reversed direction and is heading forward. Additional 50° velocity map data presented in Appendix C show that at radar antenna height, flow dynamic pressure has just about recovered to free stream value. Implications of this change in velocity with height above the landing platform are quite important, when one considers that any aircraft descending through this gradient will, in effect, experience a "suck-forward"; which can have a major impact on control requirements and aircraft aerodynamic response characteristics necessary to overcome the flow field changes.

#### EFFECT OF HULL ROLL ANGLE

Figures 38 and 39 compare data taken for 15° right and left roll angle runs, made at +30° yaw in the lowest plane (2.54M) for which velocities were measured. When compared with data taken at the same height and 0° roll, plotted in Figure 31, only small differences in the overall flow fields are evident. These small changes might be ignored for airwake math model purposes, but RMS/Standard Deviation variation about the mean velocity values should also be checked.

If it becomes necessary to model roll effects on flow (in any math model), it should be noted that the landing platform bullseye moves laterally about 1.3 inches (from its nominal 0° roll location), as the hull is rolled 15° in either direction. The principal effects of this bullseye movement can easily be compensated for by sliding the entire flow field left or right by the same 1.3 inch distance.



# DD 963 DESTROYER AIRWAKE TURBULENCE TEST

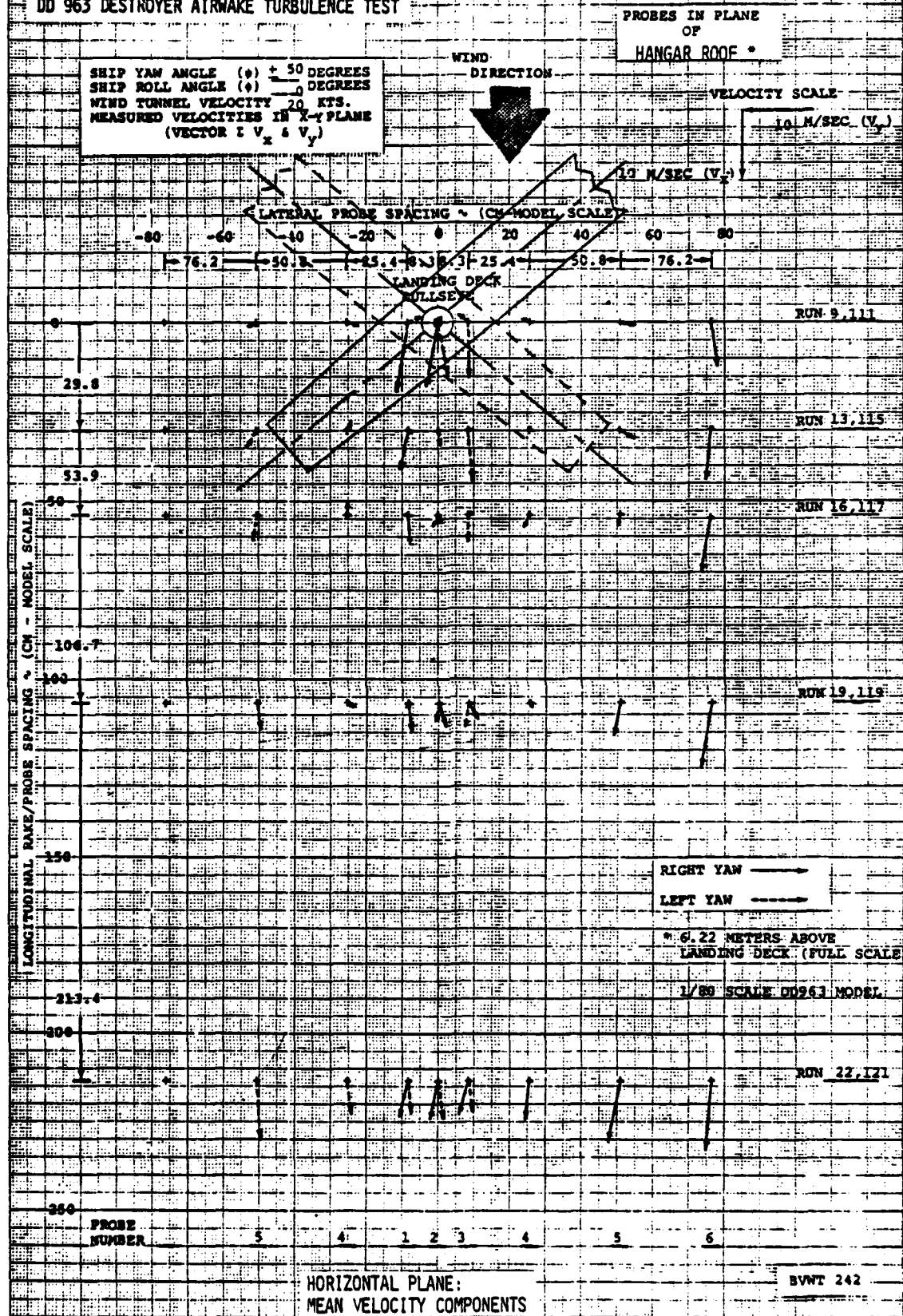


Figure 36.  
77

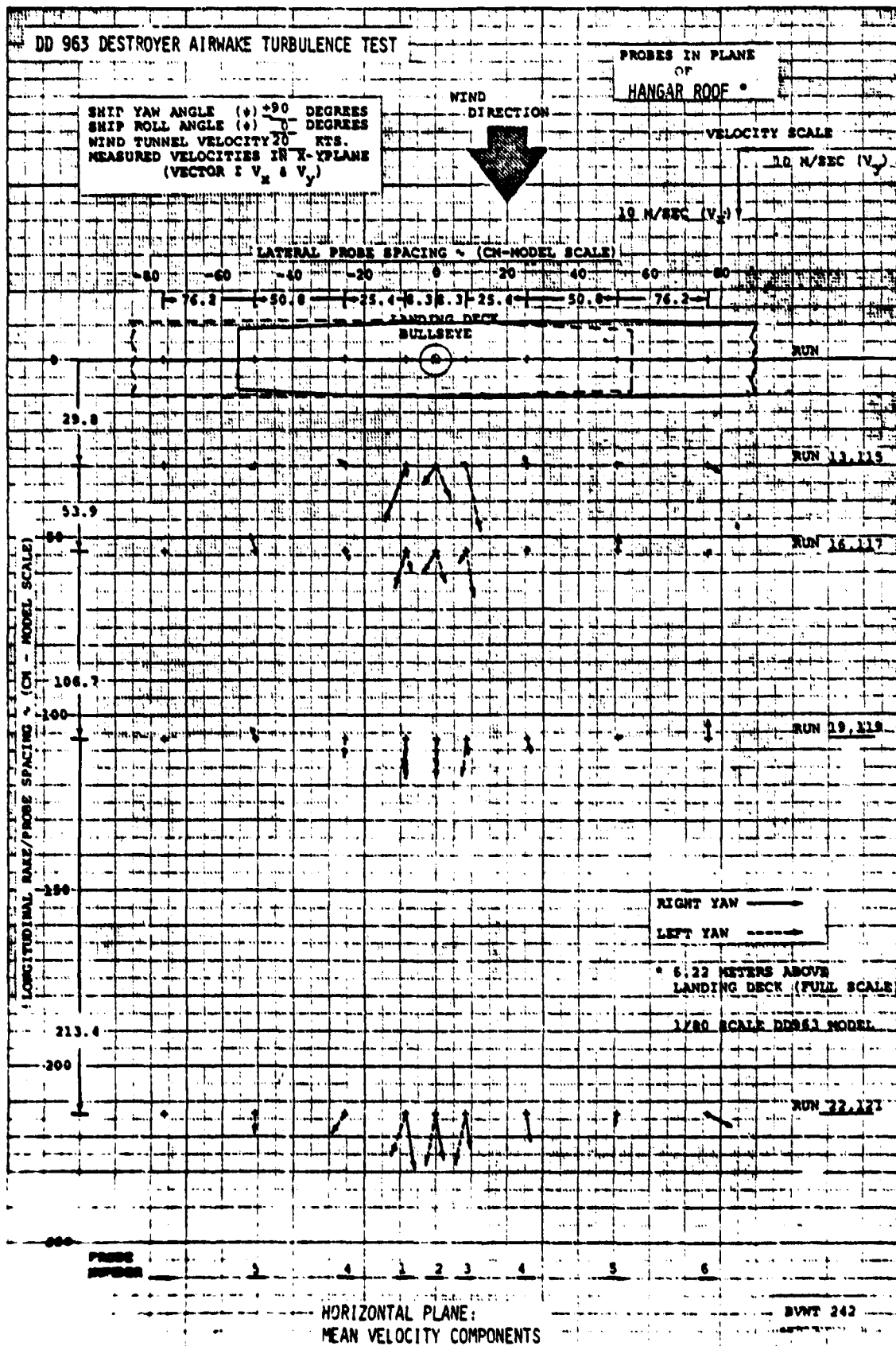


Figure 37.



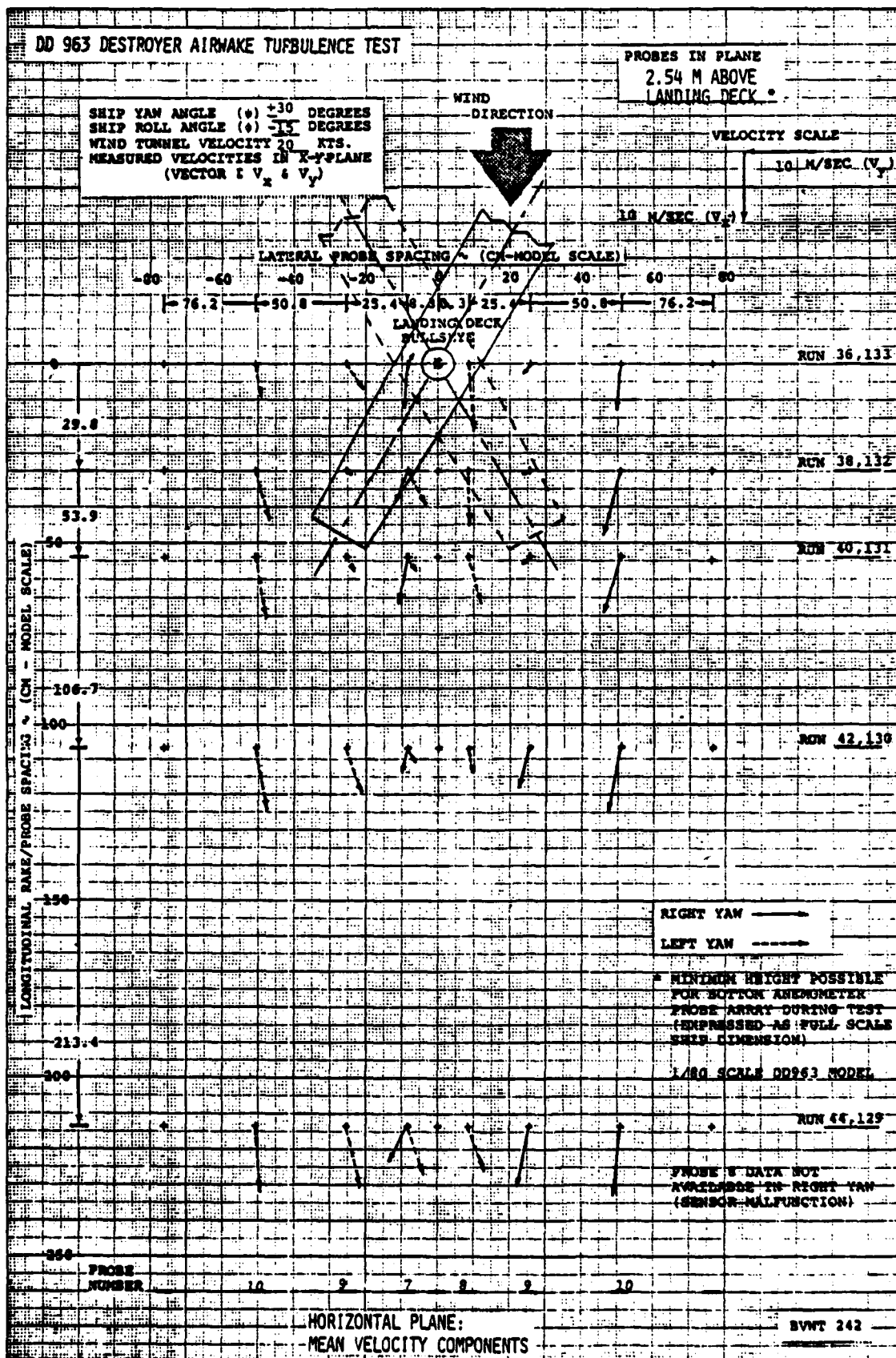


Figure 38.

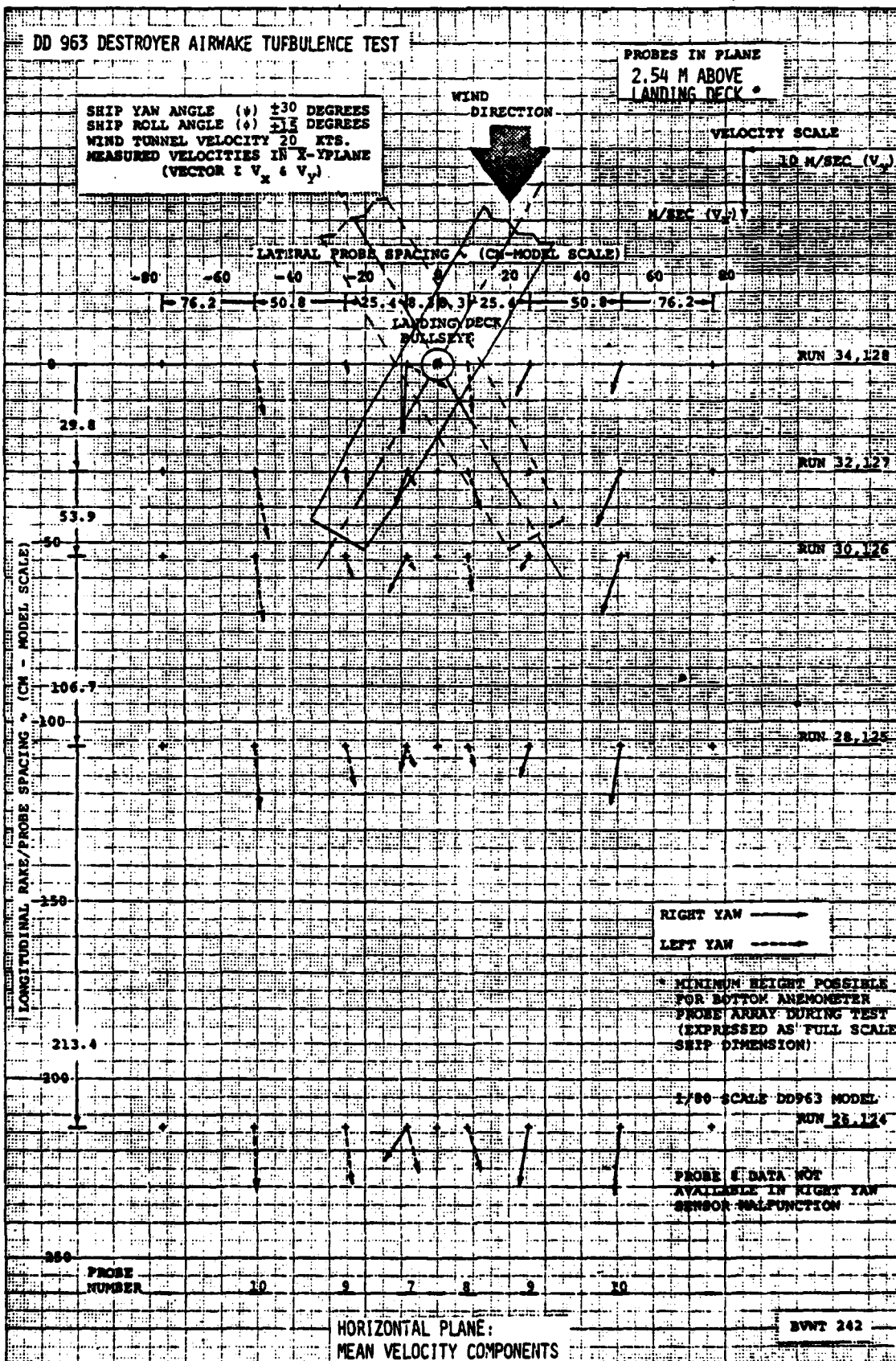


Figure 39.  
 80

#### EFFECT OF VARYING REMOTE WIND SPEED

Figures 40 and 41 compare 50° yaw (0° roll) runs made at 20 and 45 knots, respectively. Despite large amounts of separation which might be expected to cause a change in the steady flow component at times, the airwake does remain essentially constant from run to run, and it is apparent from the plots that the steady flow field can be scaled directly with the remote wind velocity ratio. Data taken at other yaw angles show similar results, when comparing magnitude and direction for various locations in the airwake. By multiplying data taken at any velocity by the ratio of its speed to any desired one, a new map can be generated. This is a significant fact in math modeling the wake for simulation.

It should be noted that the dynamic frequency content in the results does, however, change with variation in remote wind speed. What happens is a shifting of peak flow amplitude with frequency (as will be shown later); that moves the frequency spectra higher with increasing wind speed. This tendency to increase frequency is in accordance with Strouhal scaling laws discussed earlier.

#### FLOW IN VERTICAL PLANES

Figures 42 through 44, and Figure 11 in the Summary show how the 20 knot X-Z flow fields vary with yaw for each longitudinal row of probes, extending rearward from the landing platform to a point one ship length behind this deck. 0°, 30°, and 50° yaw sweeps are shown in Figures 42, 11, and 43 respectively, and Figure 44 illustrates conditions existing at 30° right yaw with the hull rolled 15° to the right.

A comparison of Figures 42 and 43 graphically illustrates how the flow over the landing deck changes with yaw; and how the large separated areas discussed before manifest themselves as small circulating vortices shown behind the outboard right hand set of probes in the 50° yaw plot.

Again, as illustrated in the horizontal flow maps, the effects of ship roll angle appear to be minimal when comparing Figures 44 and 11. Small changes are noted in the area directly over the deck, but elsewhere the airwake appears to be unaffected by rolling the ship.

In these plots, a few data points are shown with dashed lines. This information was taken from the NAEC "Close-In" test results, for probe locations where anemometers had malfunctioned during the NADC test. At other places in the plotted map data, one or two "high-speed" results were missing (as indicated in Table 3 in Appendix B), and selected low speed (on-line) information was used to fill out the plotted flow field maps shown in the report.

Since test reports from the NADC and NAEC BVWT 242/243 efforts are expected to be companion documents (and will be issued at virtually the same time), cross referencing of data between the two reports can be used to check repeatability for duplicate test conditions, and to fill in the few places where data is missing from one test and available in the other.

#### TAILWIND EVALUATION

Maps of the flow field with the ship fantail into the wind are presented in Figures 45 through 48. These figures describe the effects of

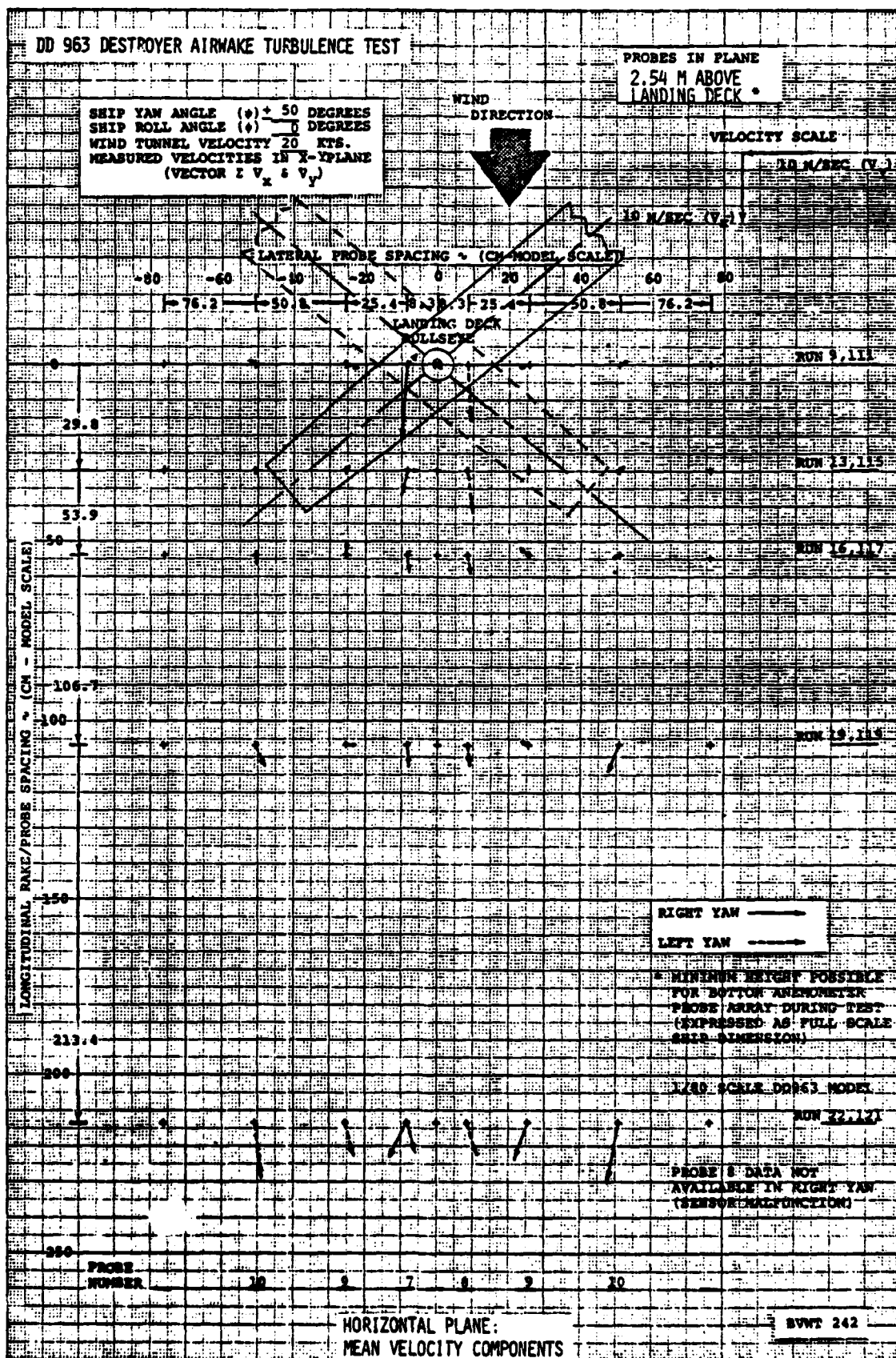


Figure 40.

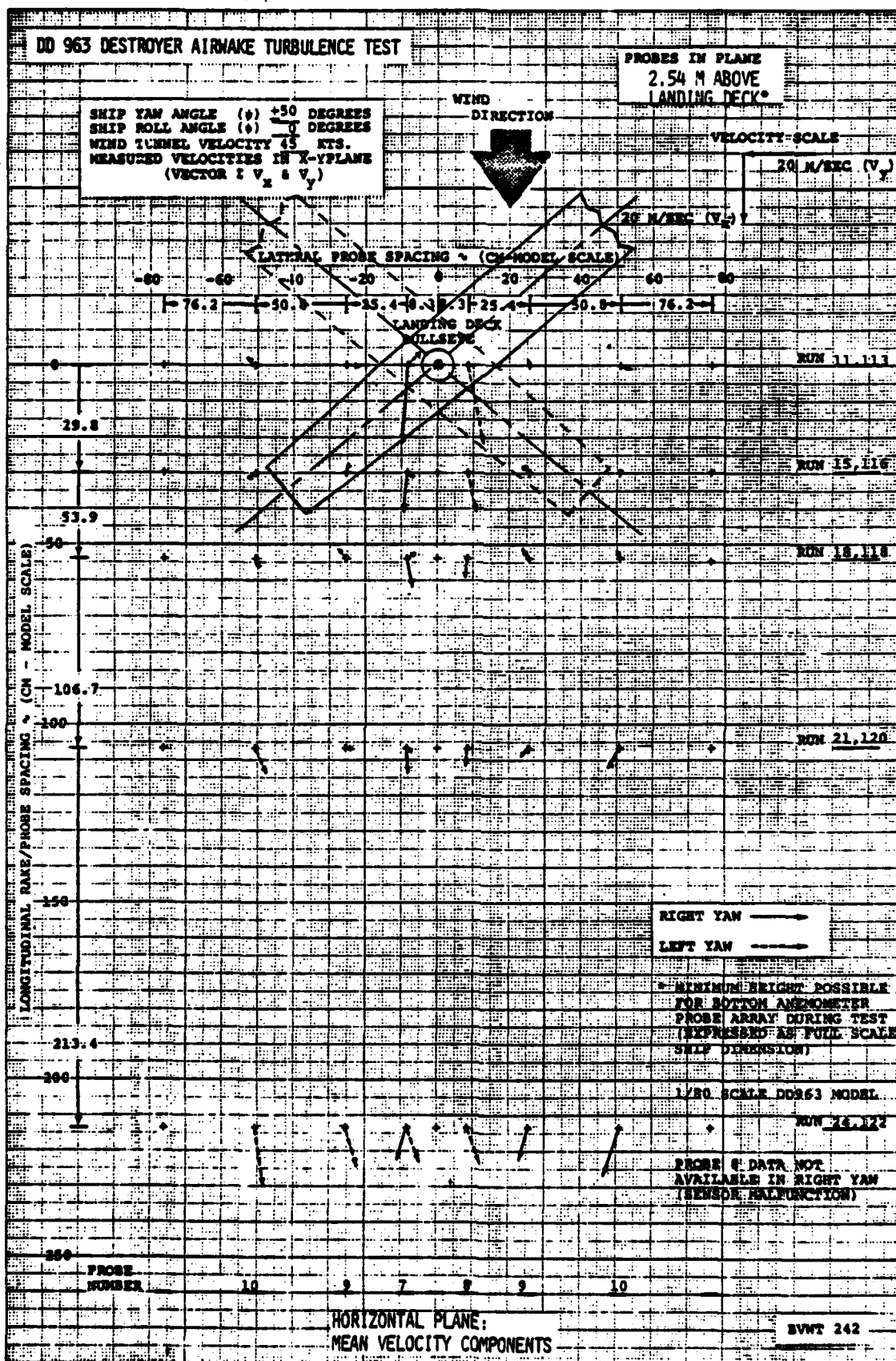
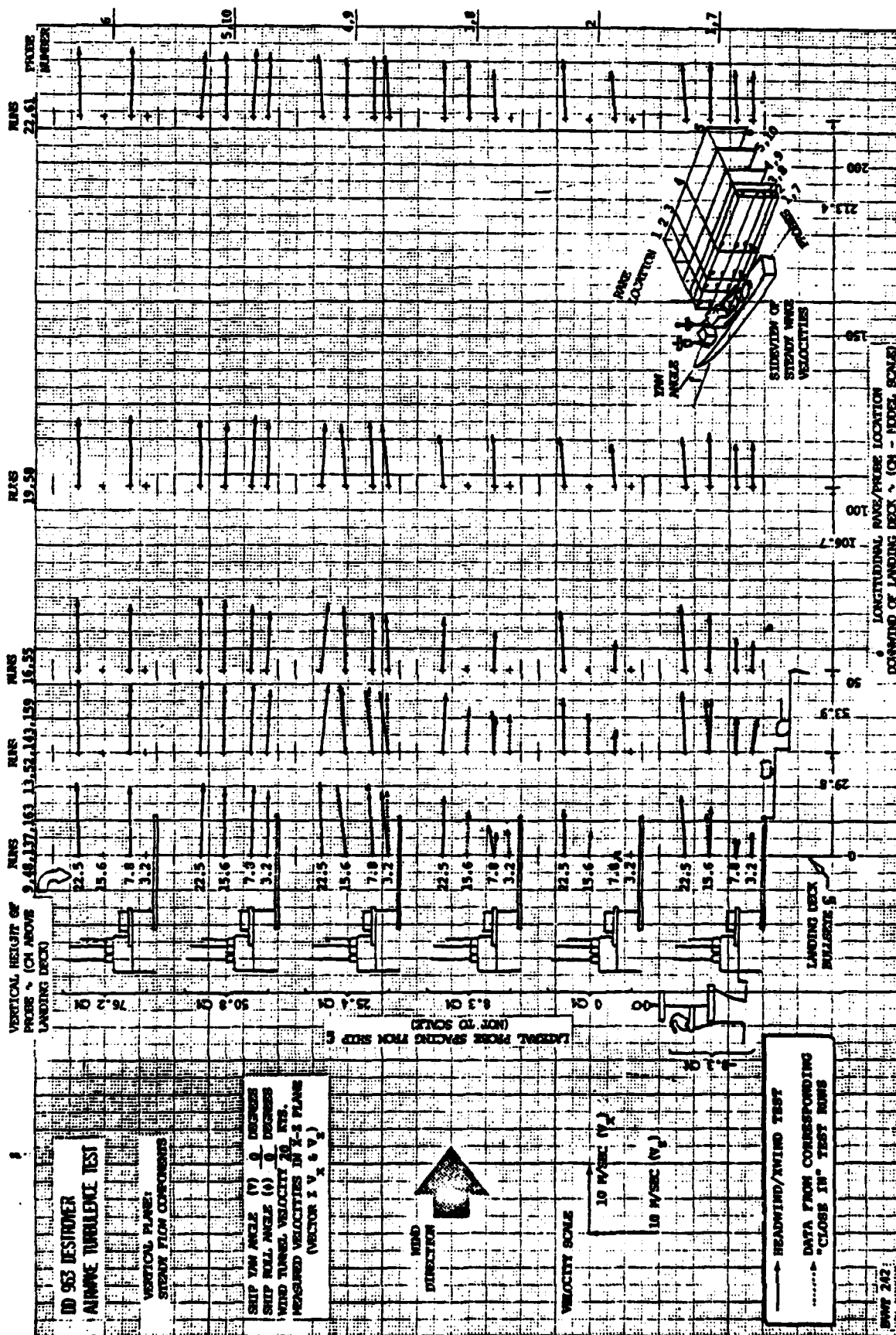


Figure 41.





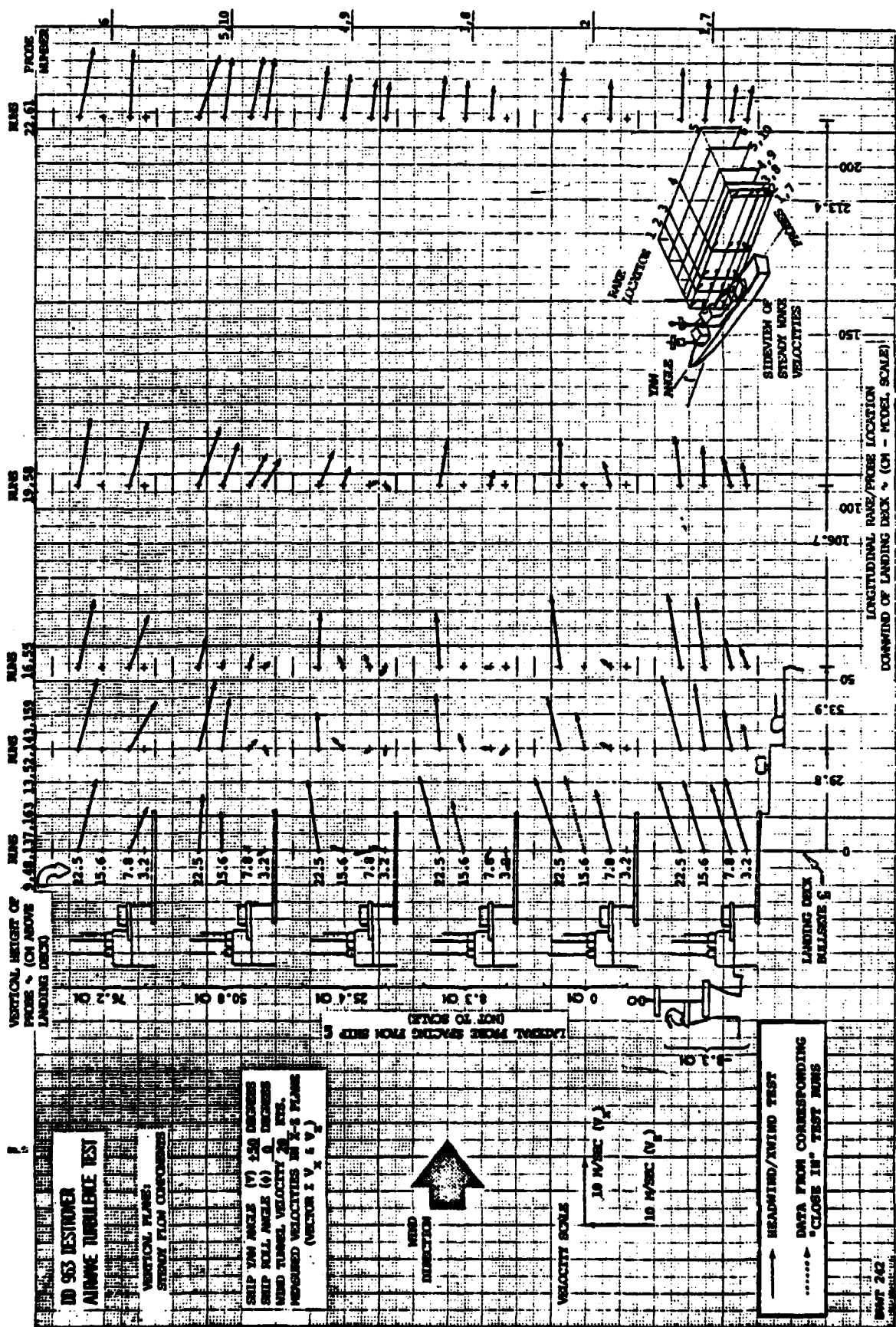


Figure 43.





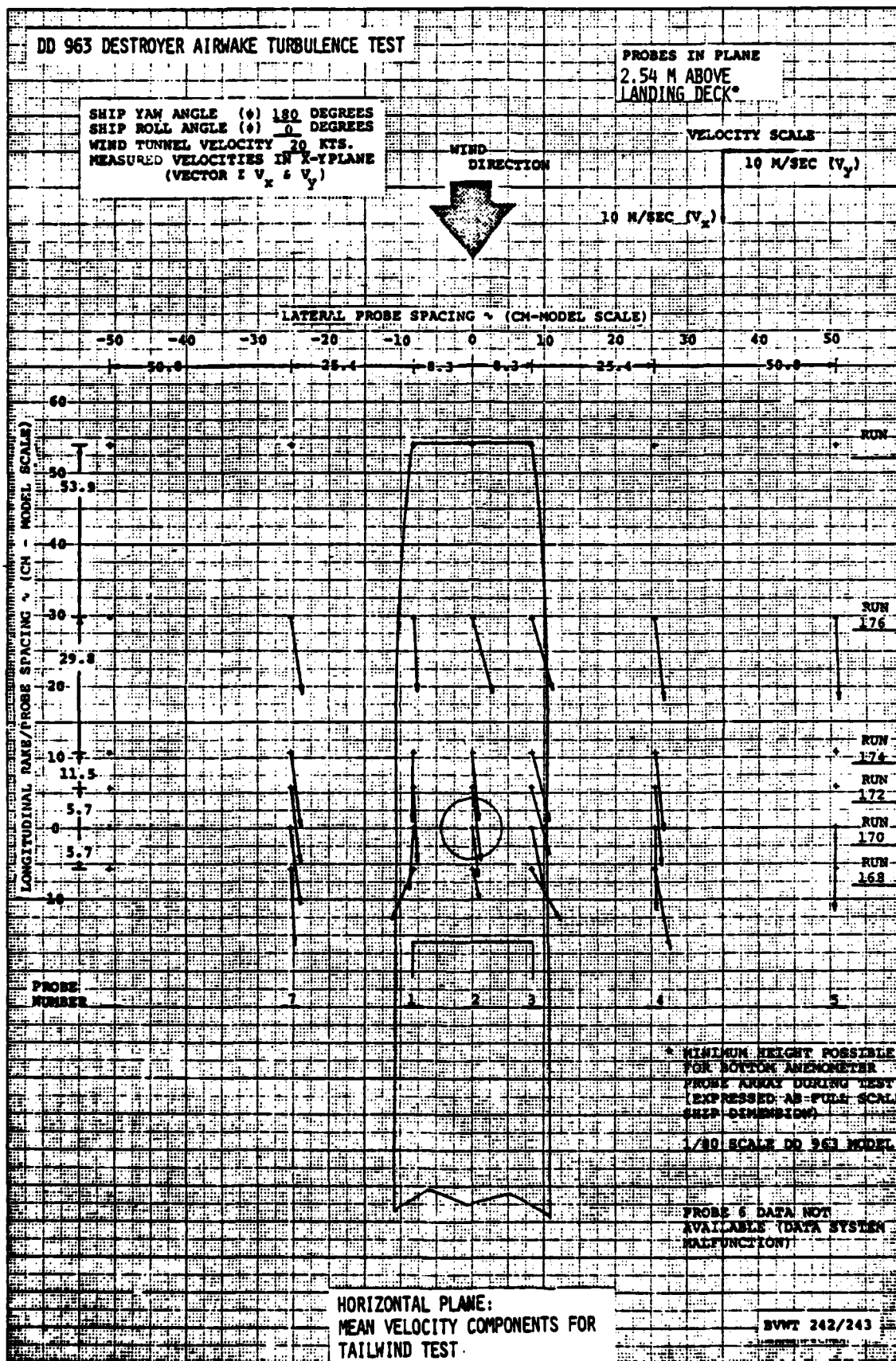


Figure 45.

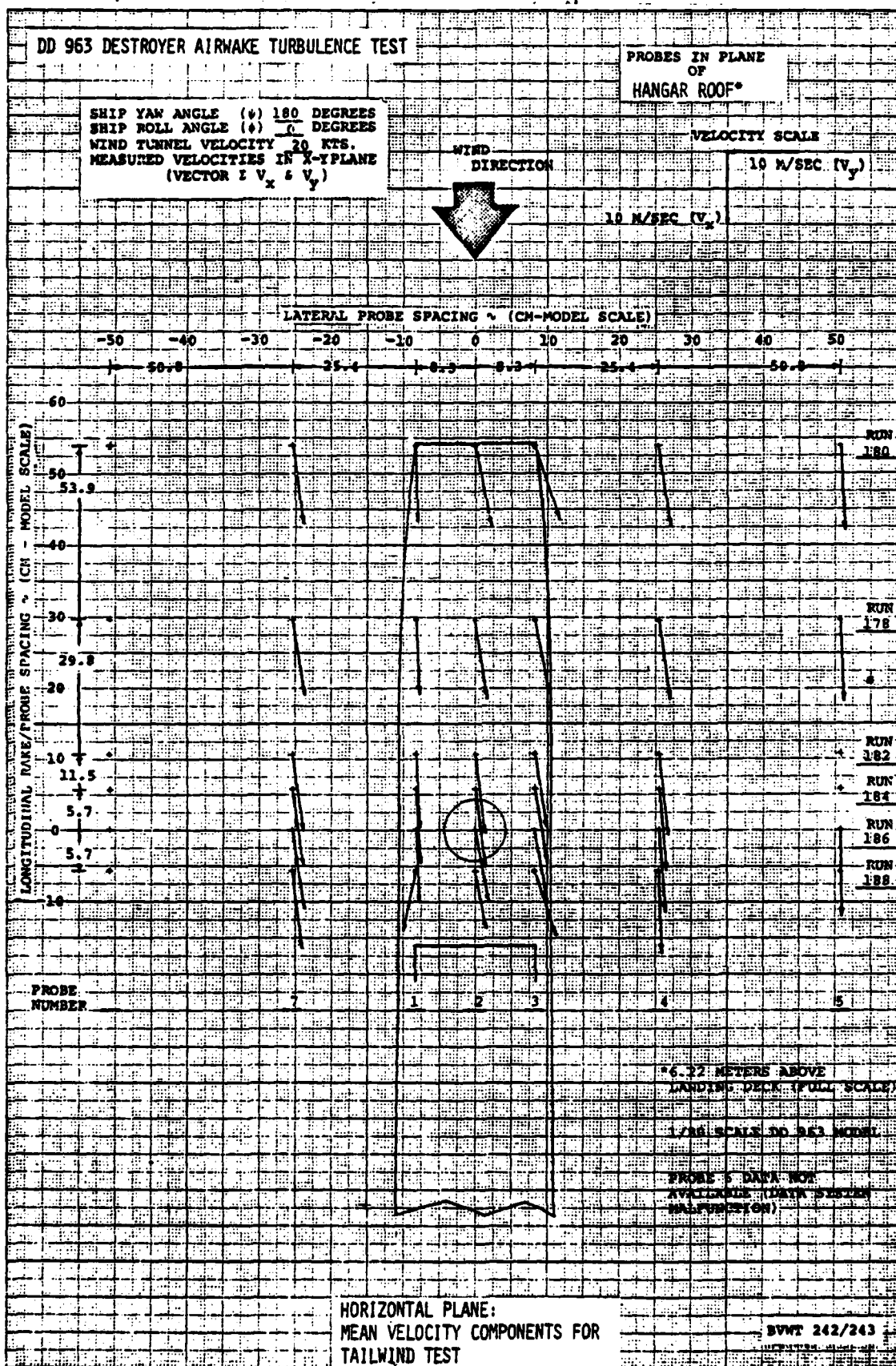


Figure 46.  
 88

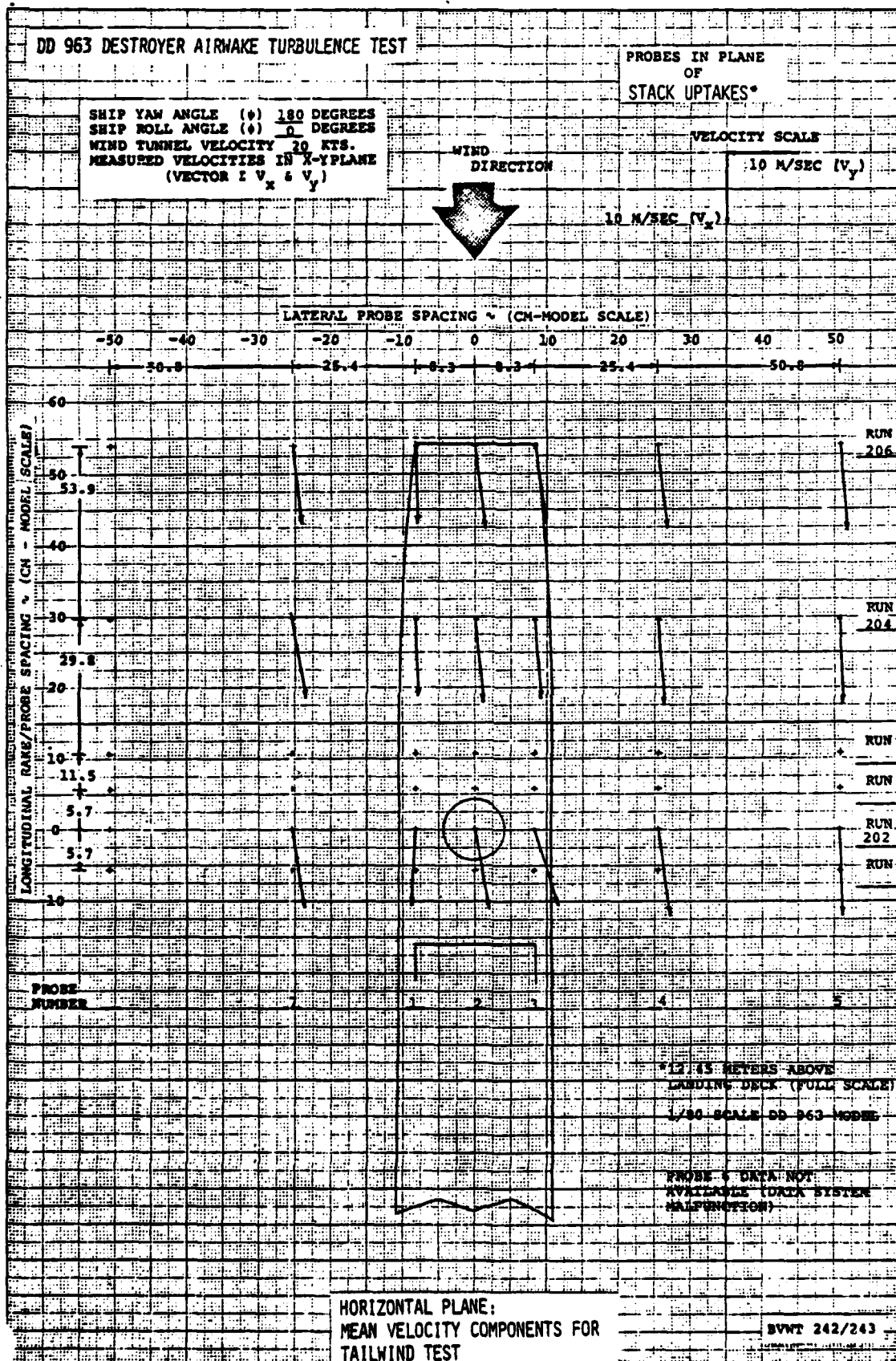


Figure 47.

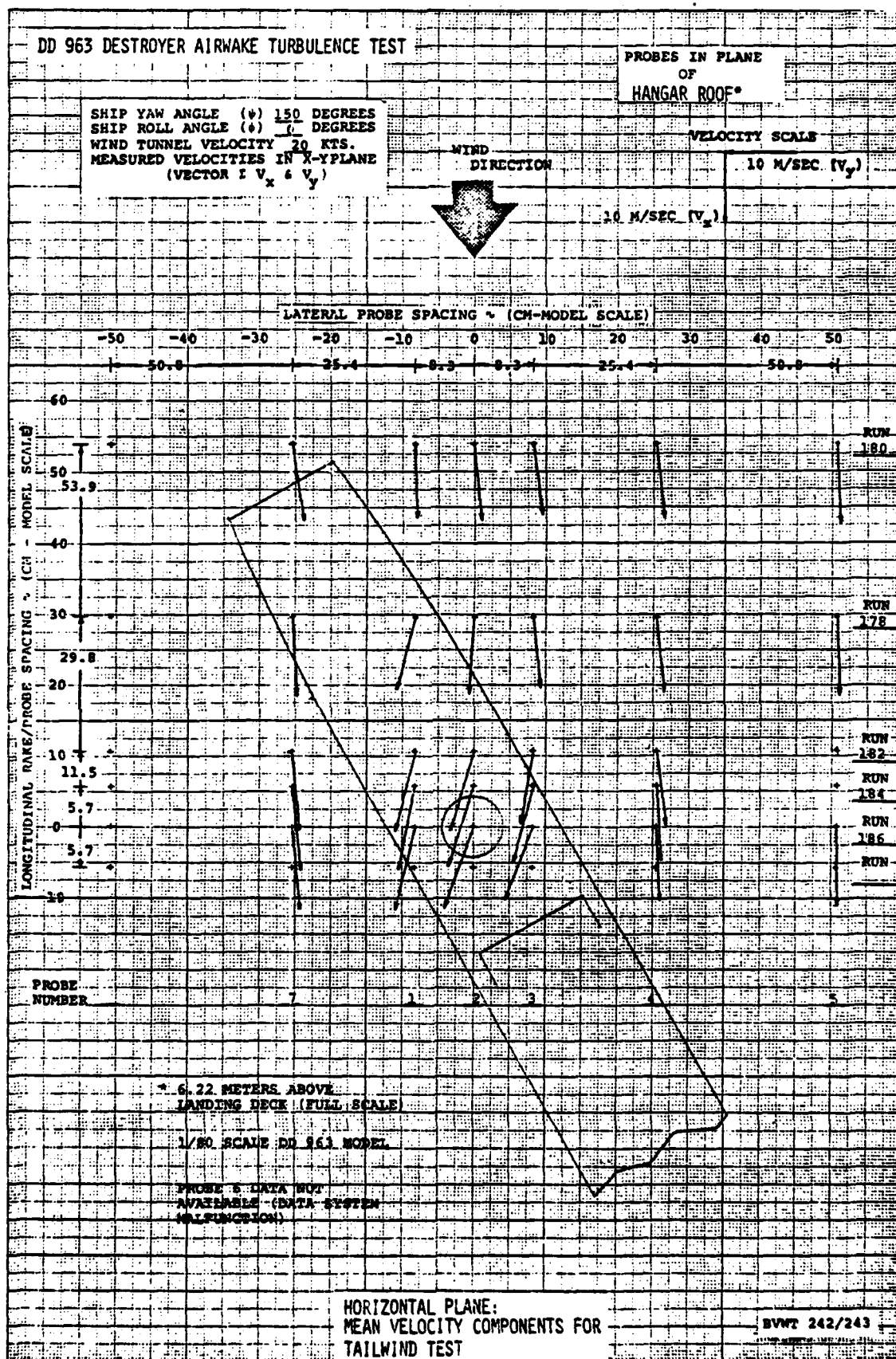


Figure 48.  
90

horizontal flow in various planes above the deck, and what happens to the airwake when the ship is yawed + 30° (heading 150°) to the remote flow. As mentioned earlier, the counterclockwise flow skewing observed for the outboard probes is most likely due to effects of the stack offset asymmetry, which was seen in the headwind plots at 0° yaw (Figures 28 through 30).

In the case of the tailwind runs at 0° yaw (180° heading), exact setting of ship yaw angle may have been slightly off because of a very small amount of hysteresis in the yaw table around this 180° heading.

Possible misalignment of the hull at 180° might have affected the flow alignment slightly, but the amount that the hull was misaligned (2°-3° maximum) would not have accounted for the 15° fantail flow skewing seen in Figure 46. In its headwind orientation at 0°, hull heading was always set up at exactly this angle, and was repeatedly checked between runs (during model changes) to ensure proper alignment for the first test points of each new run series.

### 6.3.3 Frequency Analysis of Selected Runs

Selected data points were processed through the BVWT Fast Fourier Transform frequency analysis, to develop frequency spectra plots comparing alternating three component velocity amplitudes for frequencies varying from 0 to 82 Hz (model scale). Figures 49 through 65 present the results of these studies for several standard length 0.8 second runs, and for a single extended 10.4 second test point as well. Frequency analysis results (for the DD 963) differ somewhat from those seen in the earlier FF 1052 Frigate evaluation. These differences are attributed to the difference in shape of the vessels being evaluated, and to the variation in scale of the two models.

On the basis of observations made during the DD 963 soap-bubble flow visualization studies, the more or less wide bandwidth/constant amplitude frequency response spectra, calculated for the DD 963 flow (which is discussed next) seems to be quite reasonable. The mast "lattice-work" superstructure apparently broke up the flow adjacent to the ship into numerous "mini-vortices", which produced the results seen both visually, and in the frequency plots.

### FREE STREAM FLOW

Figures 49, 50, and 51 summarize the frequency content of the longitudinal, lateral and vertical velocity components of flow, recorded by probe No. 5 located well away from the hull in free stream conditions. The test run was conducted at 20 knots tunnel speed, with the probe in question located a scale distance of 133 feet to the side of the ship. The results for all three axes show little or no activity, as expected, in the remote tunnel flow.

The very low amplitude response levels shown probably reflect noise in the data acquisition and recording systems, or in the tunnel flow itself. It should be noted, however, that the BVWT has one of the lowest

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INVESTIGATION TO STUDY THE AERODYNAMIC SHIP WAKE TURBULENCE GEN--ETC(U)

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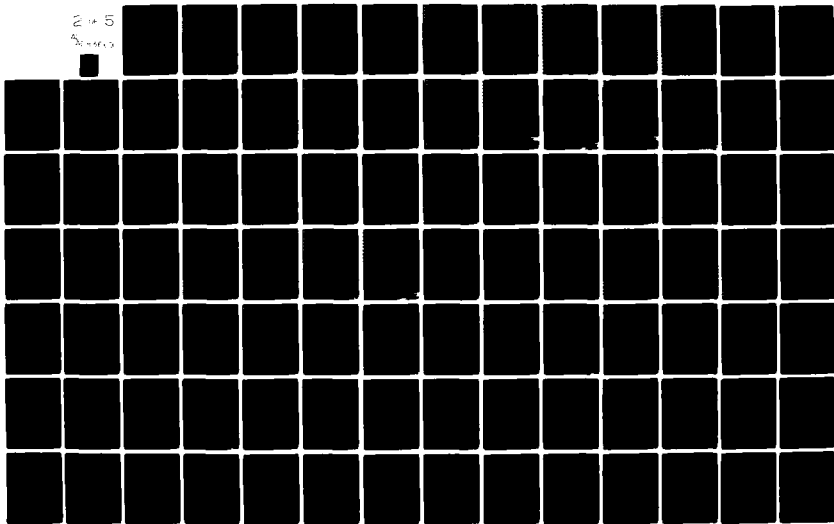
D210-11545-1

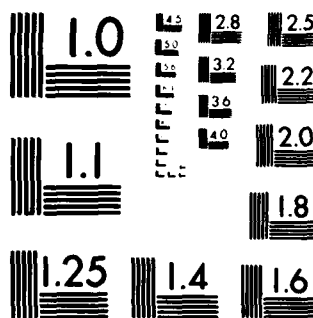
NAOC-77214-30

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2 14 5

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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS 1963 A

SHIP WAKE VELOCITY SURVEY  
128 Vx VS. FREQUENCY  
SAMPLES RUN 111 TP 2

LEGEND  
CH 5 PROBE 5

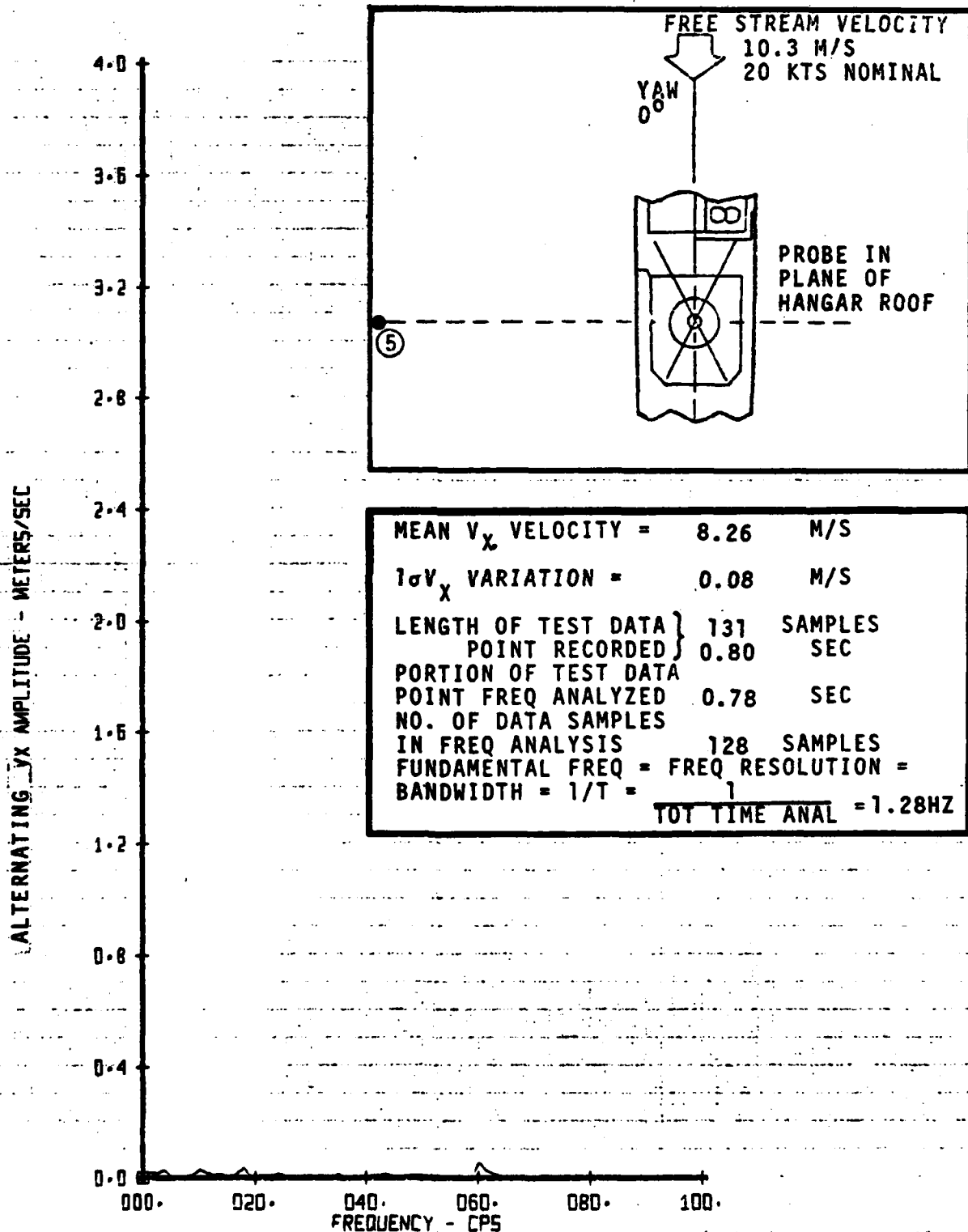


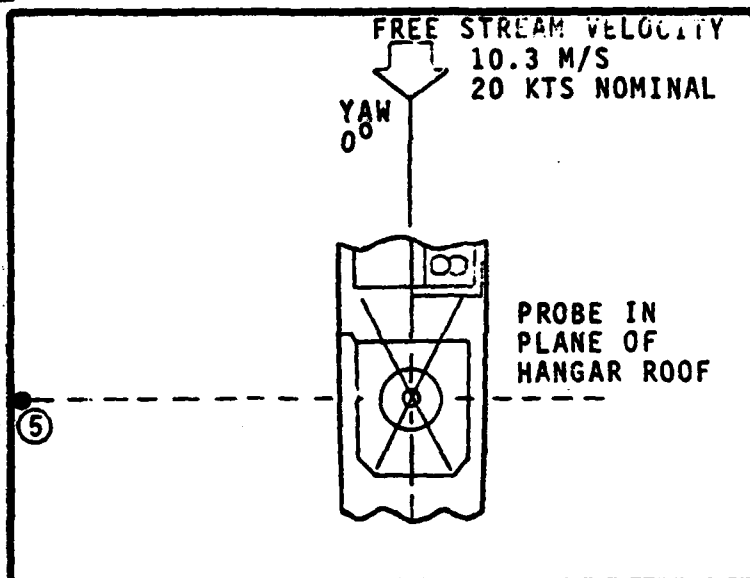
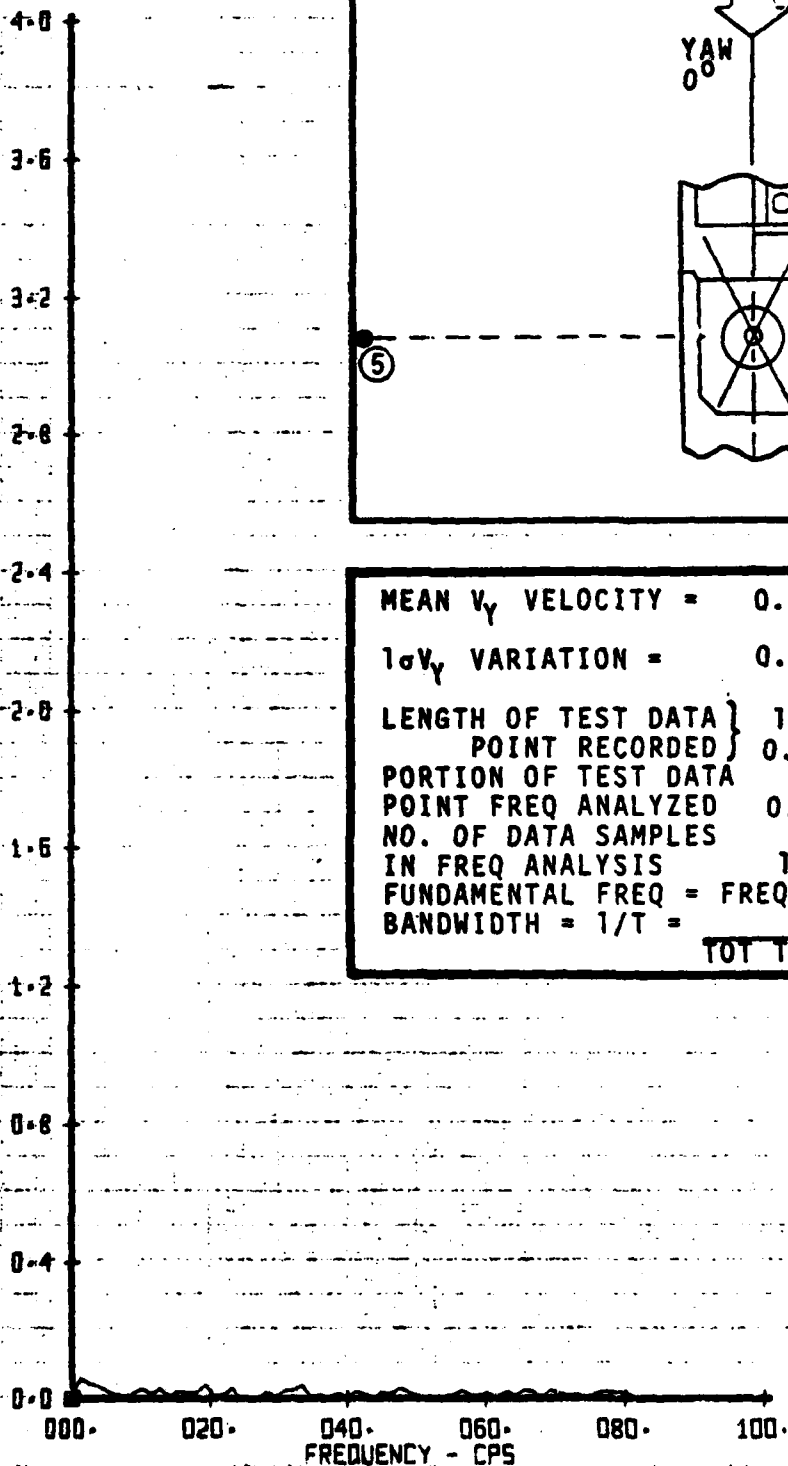
Figure 49.



SHIP WAKE VELOCITY SURVEY  
128 VY VS. FREQUENCY  
SAMPLES RUN 111 TP 2

LEGEND  
CH 5 PROBE 5

ALTERNATING VY AMPLITUDE - METERS/SEC



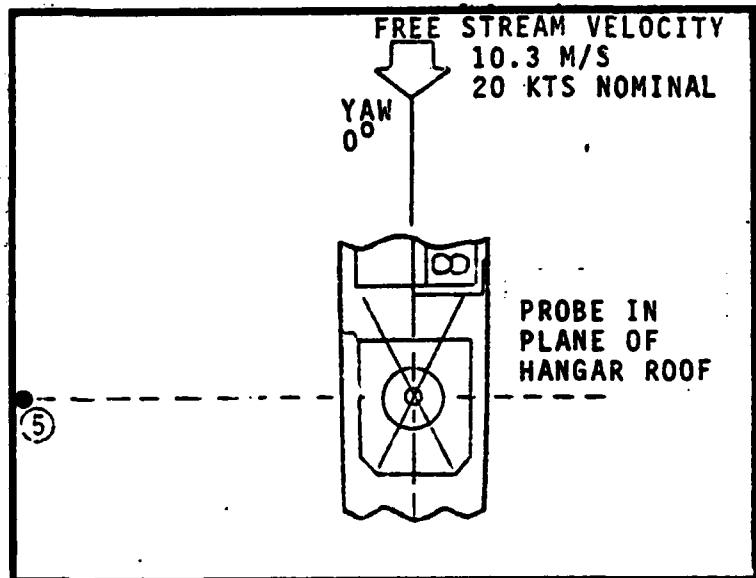
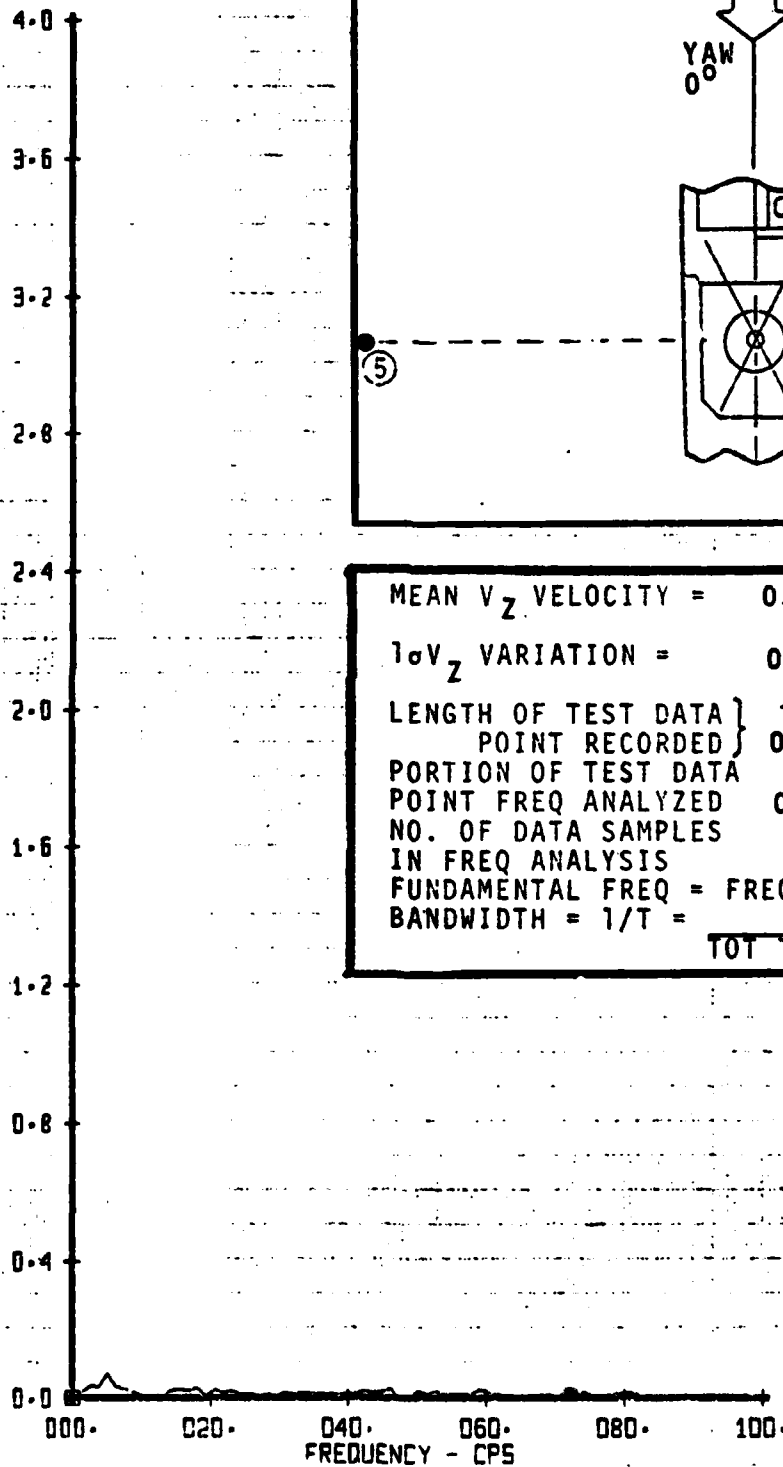
MEAN  $V_y$  VELOCITY = 0.06 M/S  
 $1\sigma V_y$  VARIATION = 0.12 M/S  
 LENGTH OF TEST DATA } 131 SAMPLES  
 POINT RECORDED } 0.80 SEC  
 PORTION OF TEST DATA  
 POINT FREQ ANALYZED 0.78 SEC  
 NO. OF DATA SAMPLES  
 IN FREQ ANALYSIS 128 SAMPLES  
 FUNDAMENTAL FREQ = FREQ RESOLUTION =  
 BANDWIDTH =  $1/T = \frac{1}{0.80} = 1.25$   
 TOT TIME ANAL = 1.28HZ

Figure 50.

SHIP WAKE VELOCITY SURVEY  
128 VZ VS. FREQUENCY  
SAMPLES RUN 111 TP 2

LEGEND  
CH 5 PROBE 5

ALTERNATING VZ AMPLITUDE - METERS/SEC



MEAN  $V_z$  VELOCITY = 0.23 M/S  
 $1\sigma V_z$  VARIATION = 0.11 M/S  
 LENGTH OF TEST DATA } 131 SAMPLES  
 POINT RECORDED } 0.80 SEC  
 PORTION OF TEST DATA  
 POINT FREQ ANALYZED 0.78 SEC  
 NO. OF DATA SAMPLES  
 IN FREQ ANALYSIS 128 SAMPLES  
 FUNDAMENTAL FREQ = FREQ RESOLUTION =  
 BANDWIDTH =  $1/T = \frac{1}{1.28}$   
 TOT TIME ANAL = 1.28HZ

Figure 51.

turbulence factors measured for any VSTOL tunnel in the world, and is therefore an excellent tool for evaluating turbulence such as that recorded in the ship airwake test.

#### FLOW BEHIND THE HANGAR

Figures 52, 53, and 54 indicate a low frequency amplitude increase when the probe location is moved to a point directly behind the corner of the hangar, with remote wind speed set at 20 knots. Low frequency Vx amplitudes on the order of 1/4 of the steady flow at this point are shown to exist in Figure 52. Vy and Vz, on the other hand, show some diminution in amplitude with increasing frequency, but less of this tendency than was observed with the FF 1052. It is also interesting to note that lateral flow (Vy) characteristically shows less low frequency content, than is shown for either Vx or Vz. In the FF 1052 test, all three components tended to be about the same in the low frequency range.

Strouhal Scaling - When the remote wind velocity is raised to 45 knots (23 M/Sec), alternating turbulence amplitude levels can be expected to increase, and the frequencies at which peak responses occur should shift to higher values in accordance with Strouhal Scaling Law similarities. Forty-five knot frequency response data for the same probe location as that just discussed is presented in Figures 55, 56, and 57. The trends expected (although somewhat difficult to discern because of the unfiltered/unsmoothed nature of the frequency spectral analysis) can be seen by comparing Vx 20 knot data in Figure 52, with similar results for 45 knots in Figure 55.

The 5 Hz and 8 Hz low frequency 20 knot response spikes shift to the right as speed approaches 45 knots, to form the peaks seen around 13 and 18 Hz in the 45 knot data. This doubling of frequency is approximately what would be expected (if Strouhal scaling holds for the complex ship superstructure tested) when going from the lower to the higher speed. It should be noted that no two repeat data points of the same condition exactly duplicate each other's frequency signature; but as will be seen later, they come fairly close for the points compared in this test. Accordingly, it is reasonable to expect only approximate correlation of the Strouhal laws when comparing high and low speed data.

#### EFFECT OF YAW

In Figures 58 and 59, alternating Vx data at 30° and 50° yaw are presented for comparison with 0° yaw results shown in Figure 55. Contrary to what was observed with the FF 1052, yawing the DD 963 seems to reduce alternating velocity amplitude in the airwake (even though the standard deviation/RMS variation increases to become a large percentage of the steady vector). This change is attributed to the screen-like effect of the mast superstructure which breaks down the flow as discussed earlier.

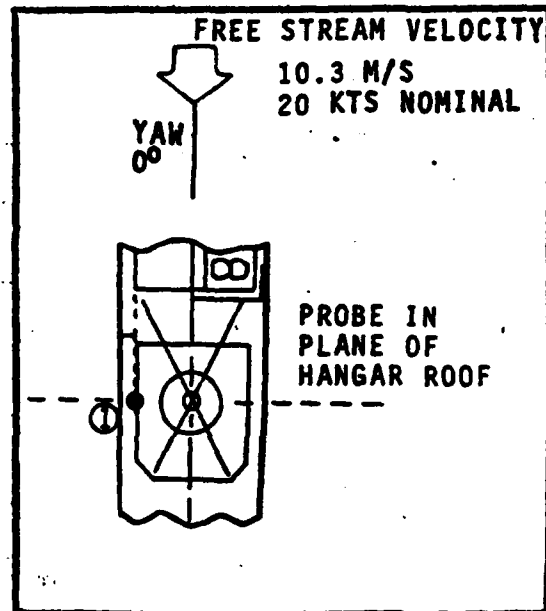
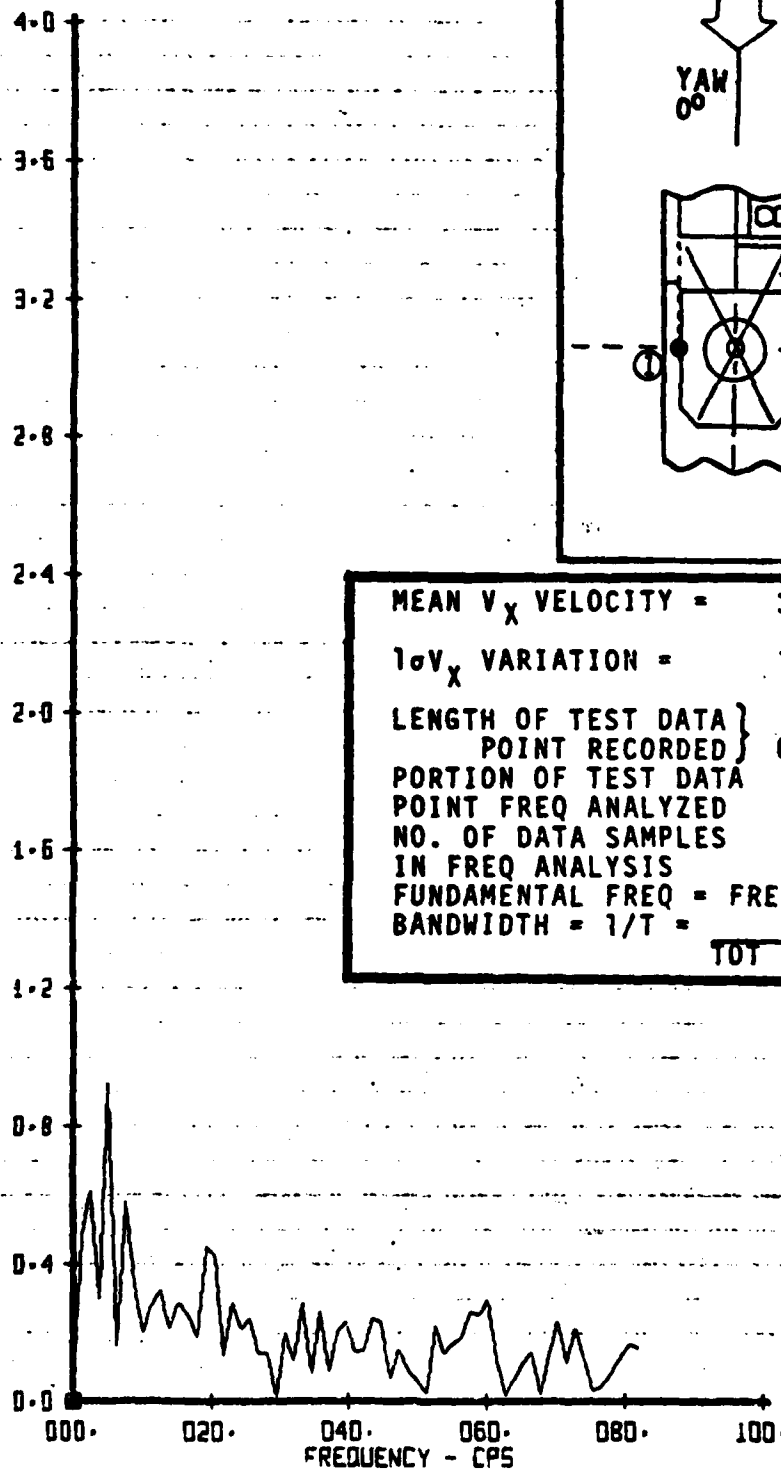
#### EXTENDED LENGTH DATA RUN

Figures 60 through 65 compare various frequency analyses of a 10.4 second 45 knot data point, for the same test conditions as shown in Figures 55-57.

SHIP WAKE VELOCITY SURVEY  
128 Vx VS. FREQUENCY  
SAMPLES RUN 111 TP 2

LEGEND  
CH 1 PROBE 1

ALTERNATING Vx AMPLITUDE - METERS/SEC

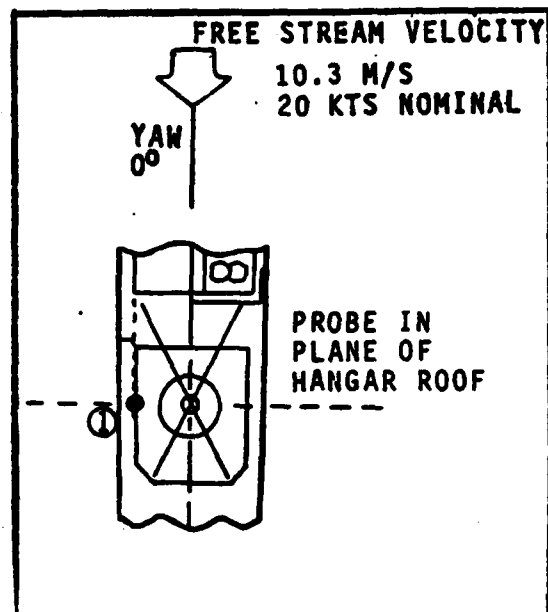


MEAN  $V_x$  VELOCITY = 3.27 M/S  
1σ  $V_x$  VARIATION = 1.44 M/S  
LENGTH OF TEST DATA } 131 SAMPLES  
POINT RECORDED } 0.80 SEC  
PORTION OF TEST DATA  
POINT FREQ ANALYZED 0.78 SEC  
NO. OF DATA SAMPLES  
IN FREQ ANALYSIS 128 SAMPLES  
FUNDAMENTAL FREQ = FREQ RESOLUTION =  
BANDWIDTH =  $1/T$  = 1  
TOT TIME ANAL = 1.28HZ

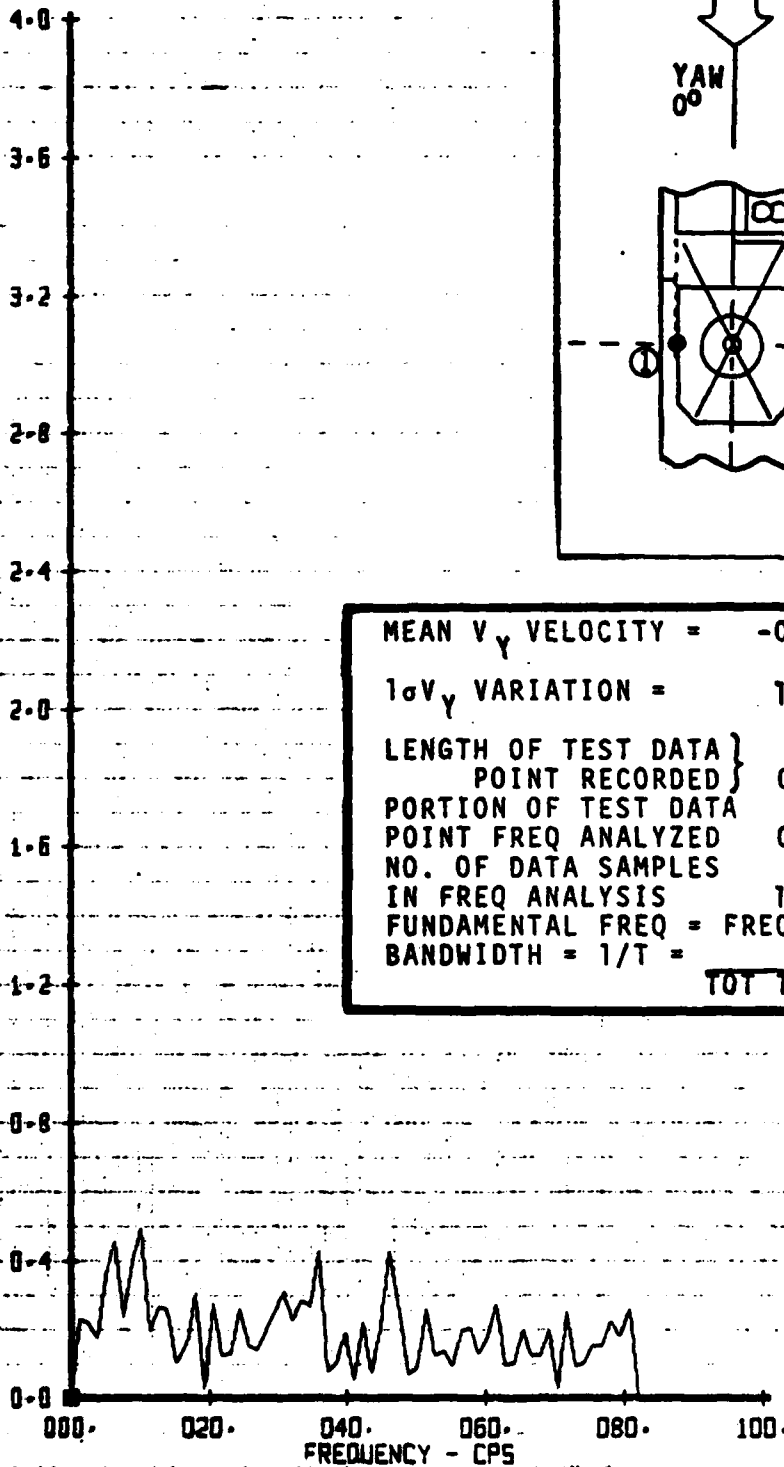
Figure 52.

SHIP WAKE VELOCITY SURVEY  
128 VY VS. FREQUENCY  
SAMPLES RUN 111 TP 2

LEGEND  
CH 1 PROBE 1



ALTERNATING VY AMPLITUDE - METERS/SEC

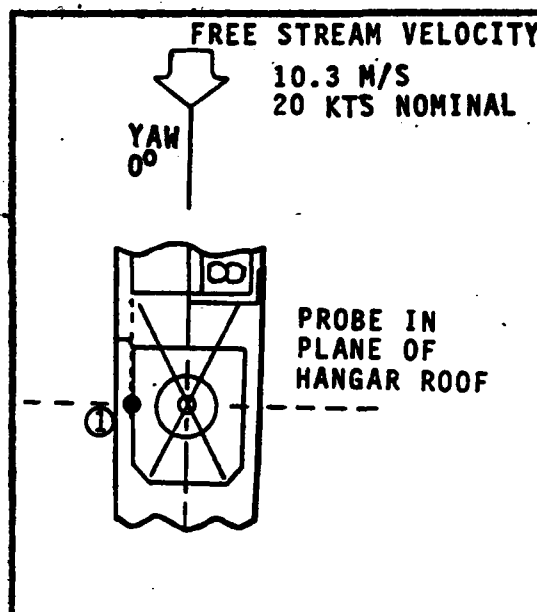


MEAN  $V_y$  VELOCITY = -0.52 M/S  
 $1\sigma V_y$  VARIATION = 1.27 M/S  
 LENGTH OF TEST DATA } 131 SAMPLES  
 POINT RECORDED } 0.80 SEC  
 PORTION OF TEST DATA  
 POINT FREQ ANALYZED 0.78 SEC  
 NO. OF DATA SAMPLES  
 IN FREQ ANALYSIS 128 SAMPLES  
 FUNDAMENTAL FREQ = FREQ RESOLUTION =  
 BANDWIDTH =  $1/T = \frac{1}{0.8} = 1.25$  HZ  
 TOT TIME ANAL = 1.28 HZ

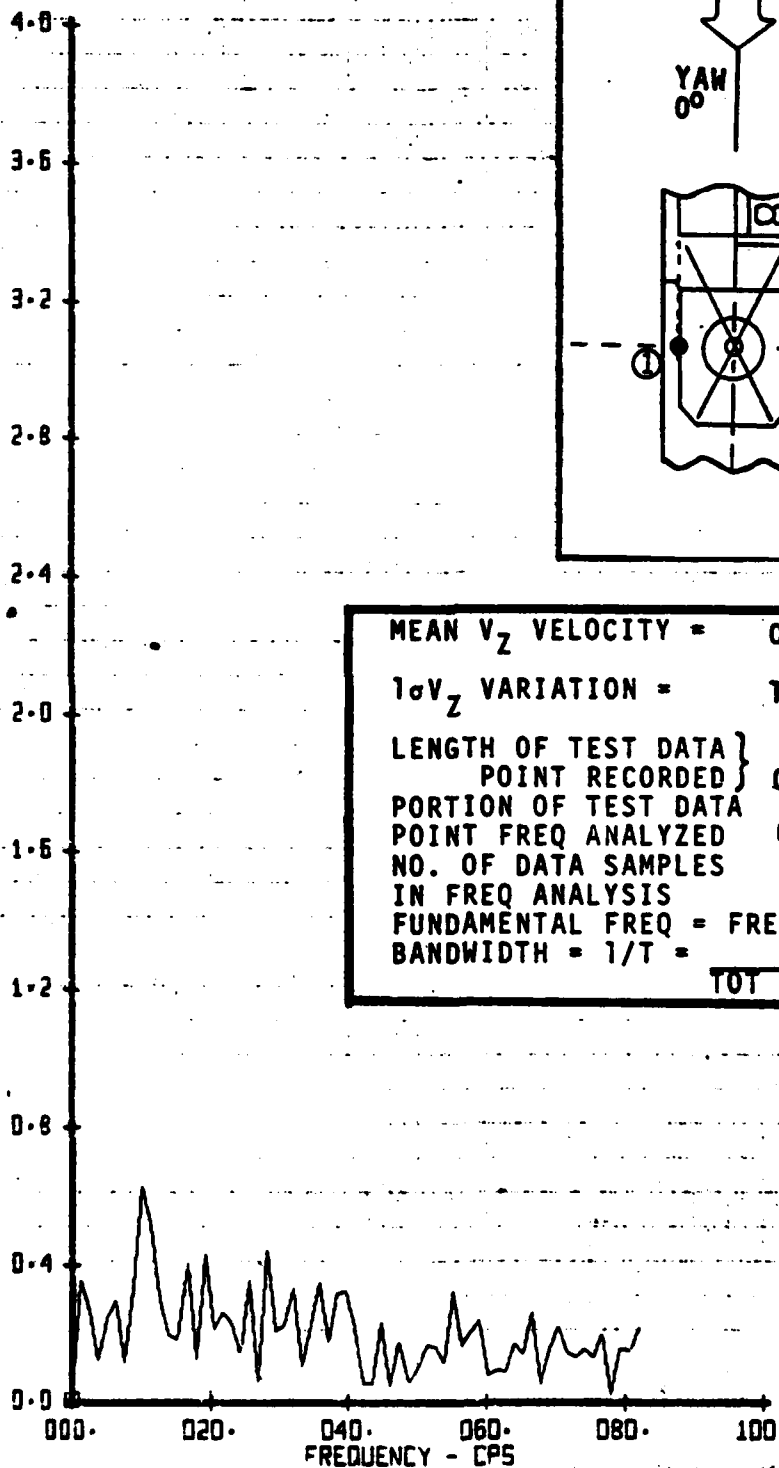
Figure 53.

SHIP WAKE VELOCITY SURVEY  
128 VZ VS. FREQUENCY  
SAMPLES RUN 111 TP 2

LEGEND  
CH 1 PROBE 1



ALTERNATING VZ AMPLITUDE - METERS/SEC



MEAN  $V_z$  VELOCITY = 0.19 M/S  
1 $\sigma$   $V_z$  VARIATION = 1.32 M/S  
LENGTH OF TEST DATA } 131 SAMPLES  
POINT RECORDED } 0.80 SEC  
PORTION OF TEST DATA  
POINT FREQ ANALYZED 0.78 SEC  
NO. OF DATA SAMPLES  
IN FREQ ANALYSIS 128 SAMPLES  
FUNDAMENTAL FREQ = FREQ RESOLUTION =  
BANDWIDTH =  $1/T = 1$   
TOT TIME ANAL = 1.28HZ

Figure 54.

SHIP WAKE VELOCITY SURVEY  
 VX VS. FREQUENCY  
 128 SAMPLES RUN 113 TP 1

LEGEND  
 CH 1 PROBE 1

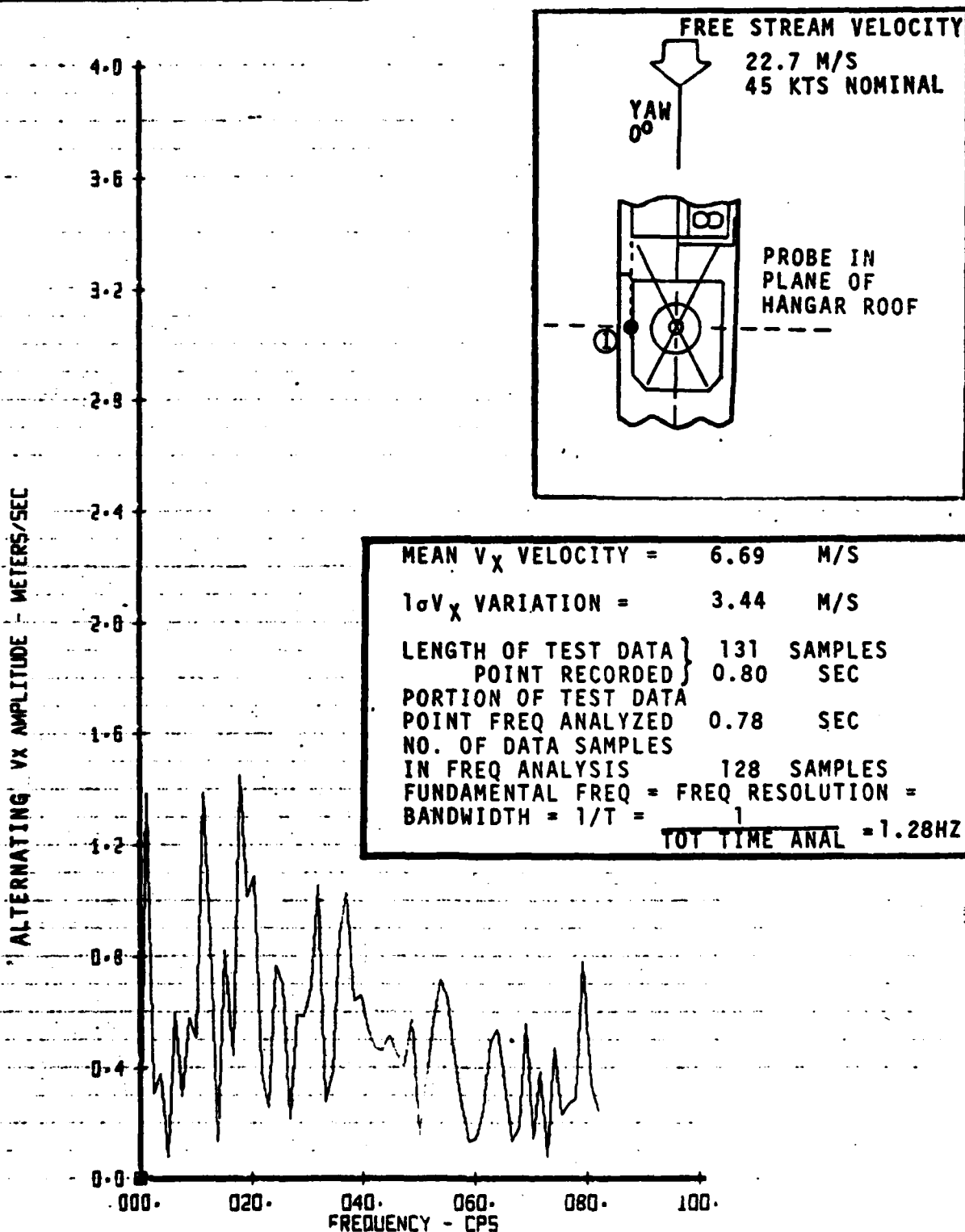


Figure 55.

## SHIP WAKE VELOCITY SURVEY

128

SAMPLES

VY VS. FREQUENCY

RUN 113 TP 1

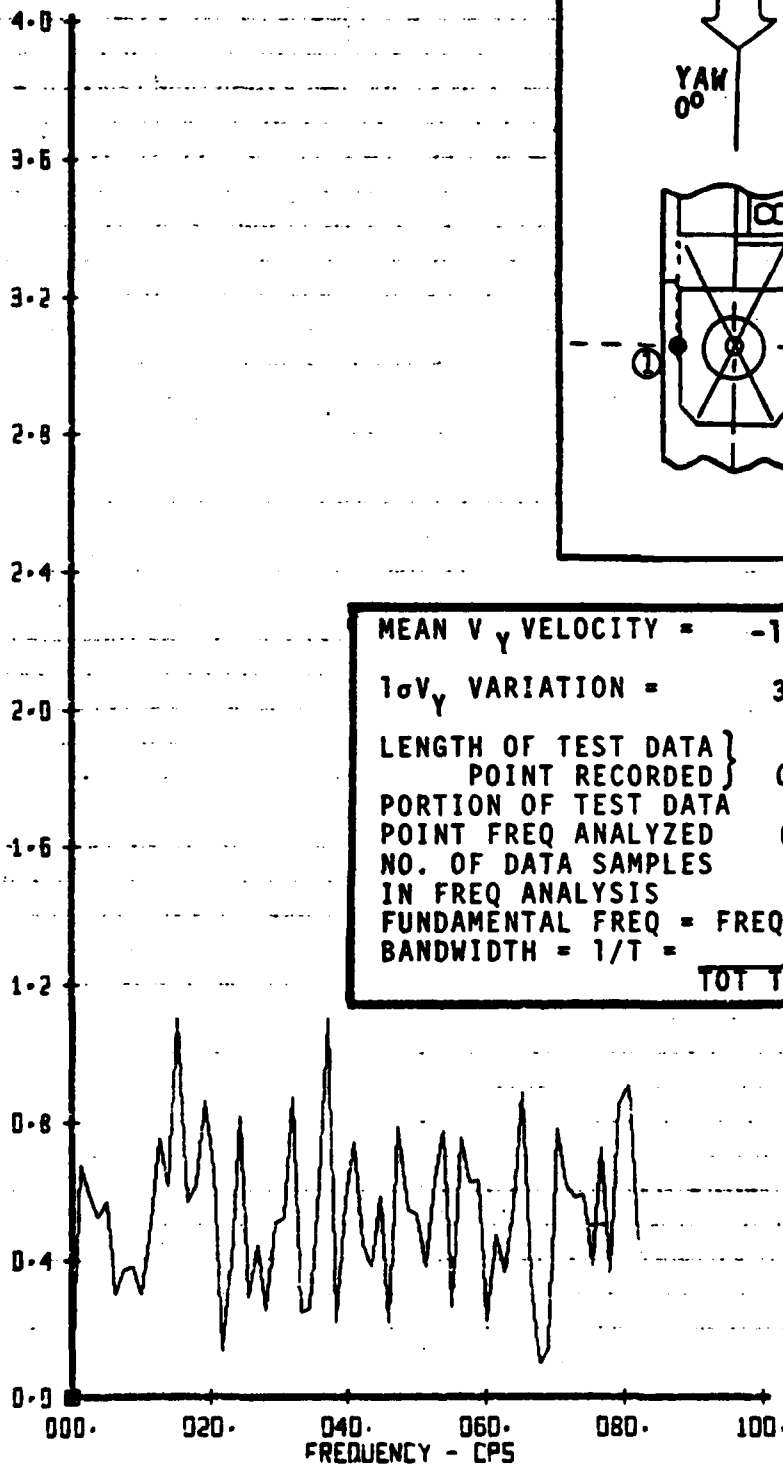
## LEGEND

CH

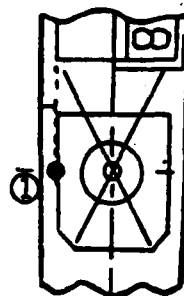
1

PROBE 1

ALTERNATING VY AMPLITUDE - METERS/SEC



FREE STREAM VELOCITY

22.7 M/S  
45 KTS NOMINALYAW  
0°PROBE IN  
PLANE OF  
HANGAR ROOFMEAN  $V_y$  VELOCITY = -1.25 M/S $1\sigma V_y$  VARIATION = 3.33 M/S

LENGTH OF TEST DATA } 131 SAMPLES

POINT RECORDED } 0.80 SEC

PORTION OF TEST DATA

POINT FREQ ANALYZED 0.78 SEC

NO. OF DATA SAMPLES

IN FREQ ANALYSIS 128 SAMPLES

FUNDAMENTAL FREQ = FREQ RESOLUTION =

BANDWIDTH =  $1/T$  = 1

TOT TIME ANAL = 1.28HZ

Figure 56.



# SHIP WAKE VELOCITY SURVEY

128

SAMPLES

VZ VS. FREQUENCY

RUN 113 TP 1

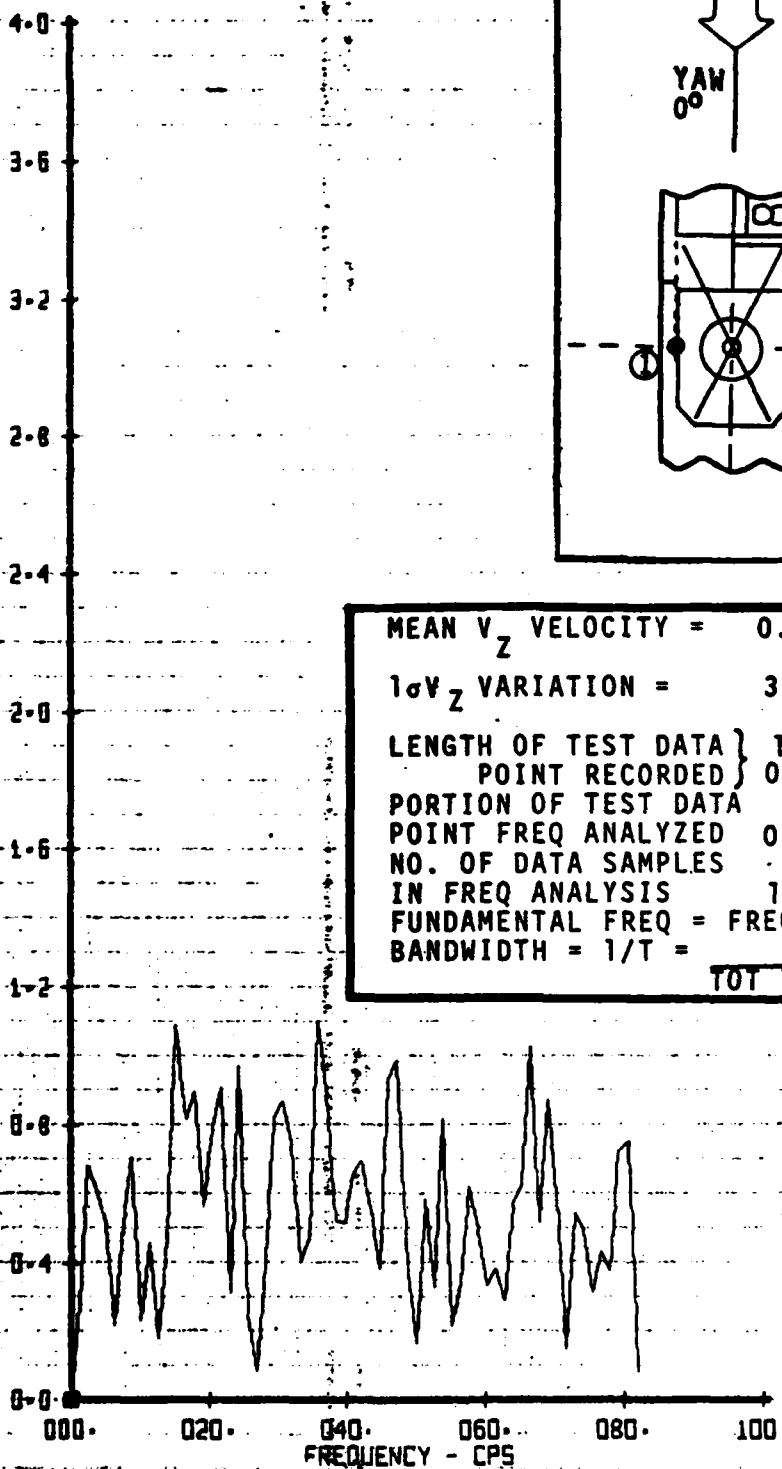
## LEGEND

CH

1

PROBE 1

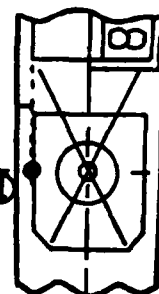
ALTERNATING VZ AMPLITUDE - METERS/SEC



## FREE STREAM VELOCITY

22.7 M/S  
45 KTS NOMINAL

YAW  
0°



PROBE IN  
PLANE OF  
HANGAR ROOF

MEAN  $V_z$  VELOCITY = 0.50 M/S

$1\sigma V_z$  VARIATION = 3.46 M/S

LENGTH OF TEST DATA } 131 SAMPLES  
POINT RECORDED } 0.80 SEC

PORTION OF TEST DATA  
POINT FREQ ANALYZED 0.78 SEC

NO. OF DATA SAMPLES  
IN FREQ ANALYSIS 128 SAMPLES

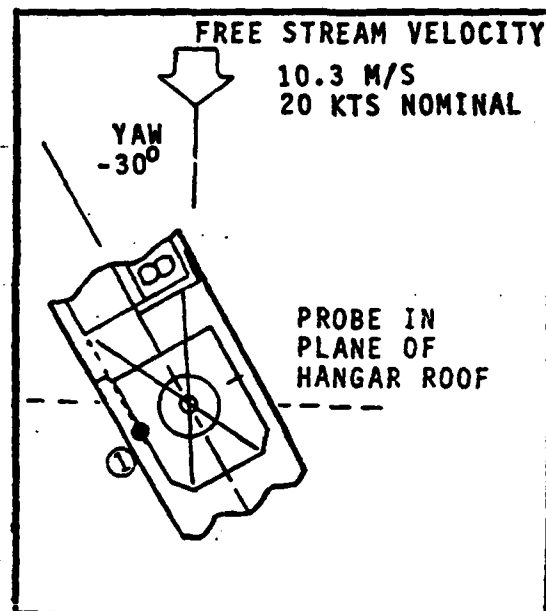
FUNDAMENTAL FREQ = FREQ RESOLUTION =

BANDWIDTH =  $1/T = 1$   
TOT TIME ANAL = 1.28HZ

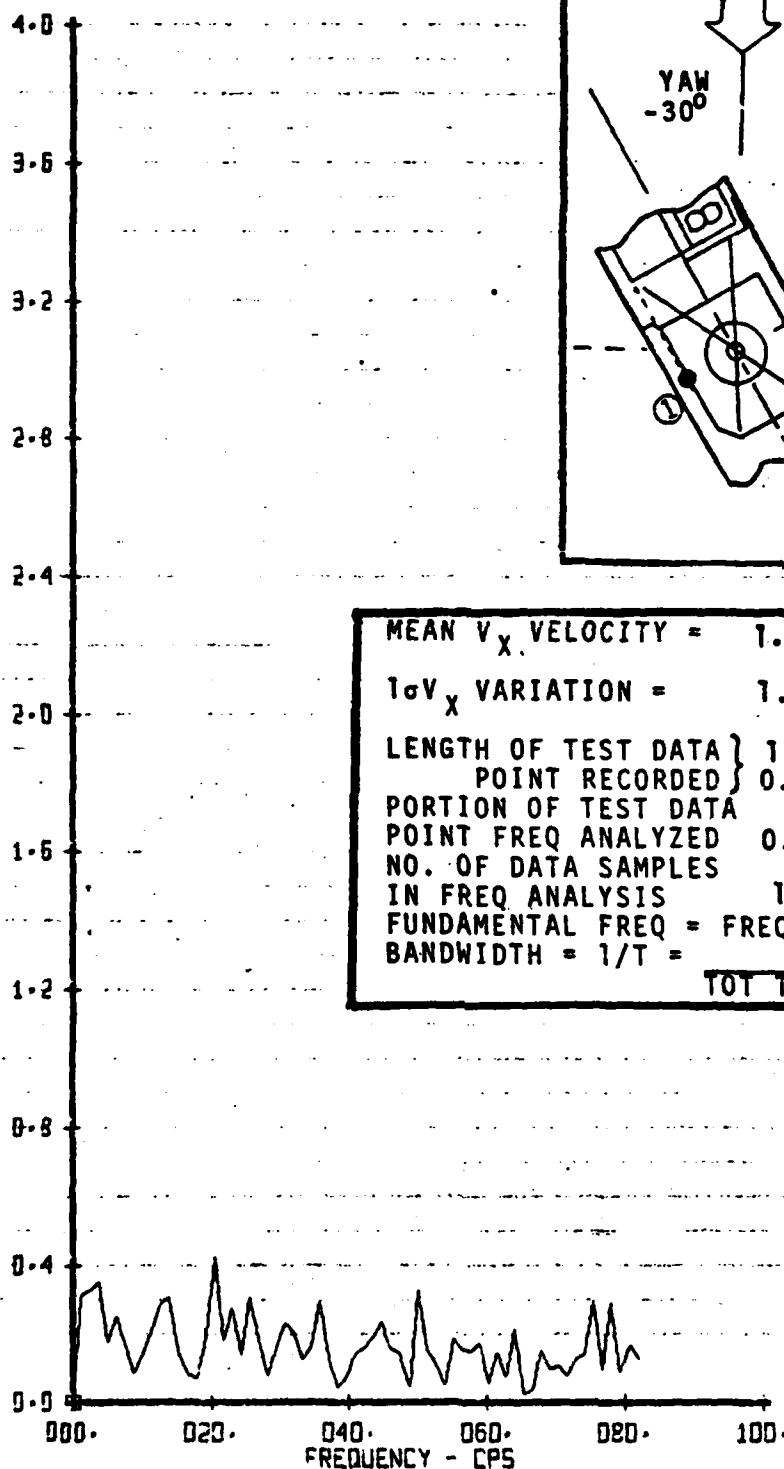
Figure 57.

SHIP WAKE VELOCITY SURVEY  
 128 Vx VS. FREQUENCY  
 SAMPLES RUN 111 TP 3

LEGEND  
 CH 1 PROBE 1



ALTERNATING Vx AMPLITUDE - METERS/SEC

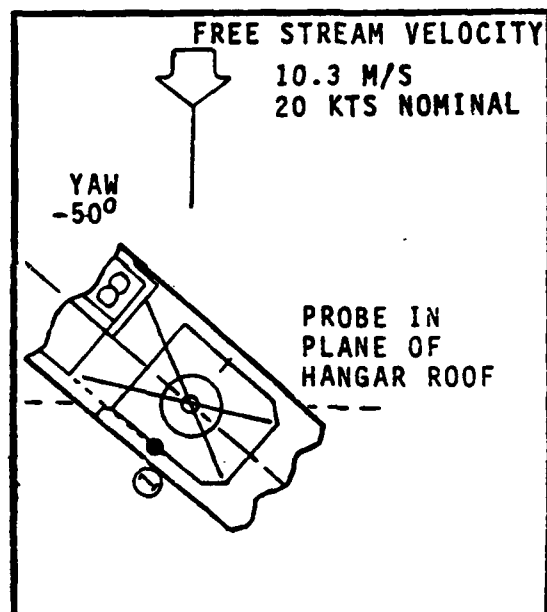
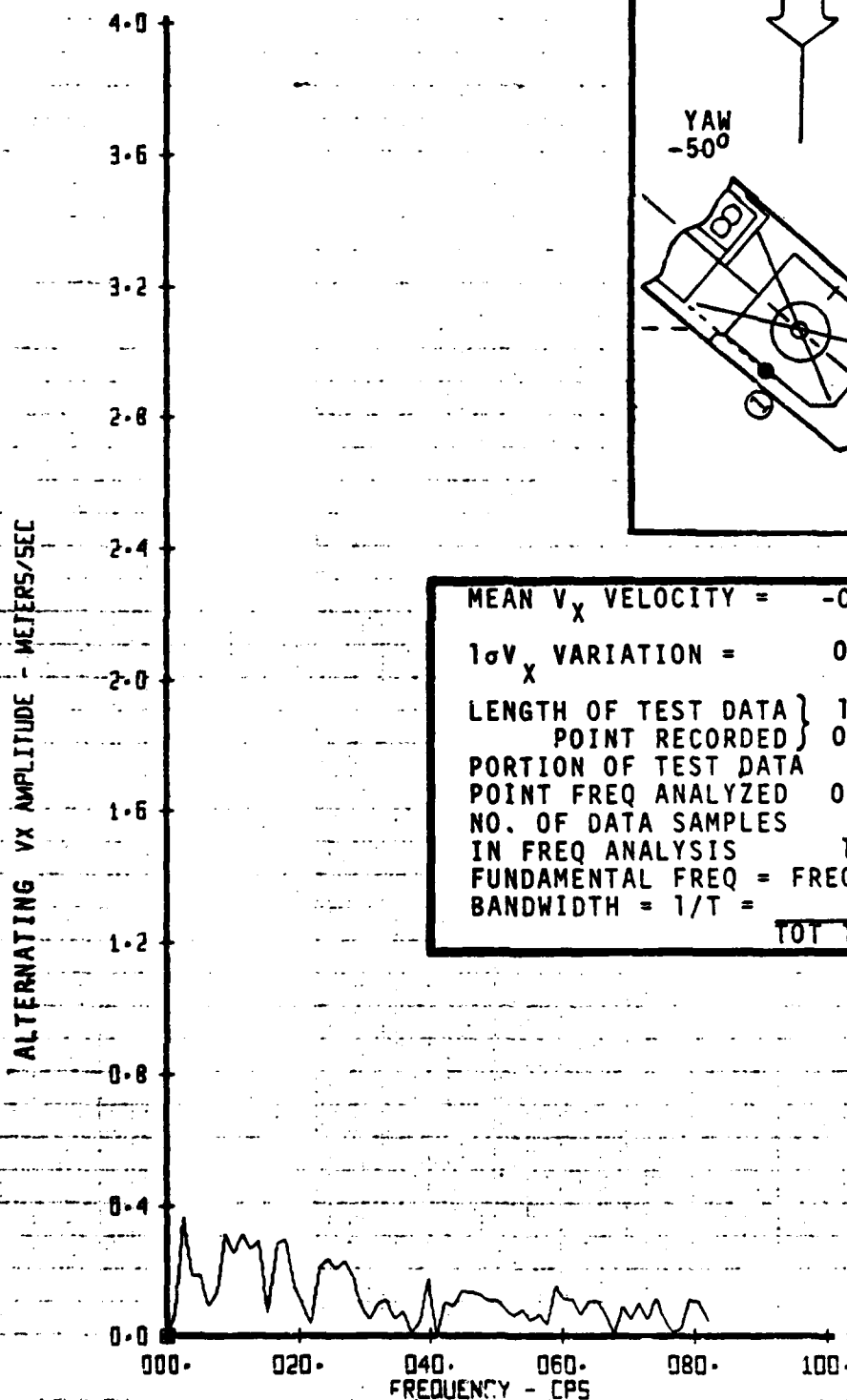


MEAN  $V_x$  VELOCITY = 1.23 M/S  
 $1\sigma V_x$  VARIATION = 1.07 M/S  
 LENGTH OF TEST DATA } 131 SAMPLES  
 POINT RECORDED } 0.80 SEC  
 PORTION OF TEST DATA  
 POINT FREQ ANALYZED 0.78 SEC  
 NO. OF DATA SAMPLES  
 IN FREQ ANALYSIS 128 SAMPLES  
 FUNDAMENTAL FREQ = FREQ RESOLUTION =  
 BANDWIDTH =  $1/T = 1$   
 TOT TIME ANAL = 1.28HZ

Figure 58.

SHIP WAKE VELOCITY SURVEY  
128 Vx VS. FREQUENCY  
SAMPLES RUN 111 TP 4

LEGEND  
CH 1 PROBE 1



MEAN  $V_x$  VELOCITY = -0.74 M/S  
 $1\sigma V_x$  VARIATION = 0.84 M/S  
 LENGTH OF TEST DATA } 131 SAMPLES  
 POINT RECORDED } 0.80 SEC  
 PORTION OF TEST DATA  
 POINT FREQ ANALYZED 0.78 SEC  
 NO. OF DATA SAMPLES  
 IN FREQ ANALYSIS 128 SAMPLES  
 FUNDAMENTAL FREQ = FREQ RESOLUTION =  
 BANDWIDTH =  $1/T = 1$   
 TOT TIME ANAL = 1.28HZ

Figure 59.

When the longitudinal velocity  $V_x$  data presented in Figure 60 was first compared with its 0.8 second counterpart (Figure 55), it was suspected that there might have been a problem with the FFT frequency analysis, or that the 0.8 second run was too short and thus unrepresentative of the flow state around the model. An in-depth analysis conducted with the Run 114, Test Point 1 results showed neither of these two suspicions to have been correct. In fact, both sets of data are most likely valid, and the differences are attributed to increased spectral resolution possible with the longer run. Note that the mean and  $1\sigma$  values for both runs are similar in magnitude.

After careful study of information presented in the Reference 3 document, and lengthy discussions with data processing experts familiar in the field of discrete FFT analysis of digitally sampled data, the cause of the roughly 50% reduction in amplitude of the 10+ second run became apparent. When higher resolution is possible due to a longer sample length, more spectral lines occur in the original bandwidth under consideration. In this case, the 0.8 second fundamental frequency-bandwidth is about 1.28 Hz, whereas the frequency resolution of the longer data point is 0.16 Hz. As greater and greater resolution is used in an analysis, frequency spectral lines (which are only approximated as straight lines, but really are of the form  $\sin x/x$ ) tend to be resolved into more lines of a different amplitude. Characteristically, wide bandwidth responses of the type seen in the DD 963 data tend to show reduced amplitudes when greater resolution is used.

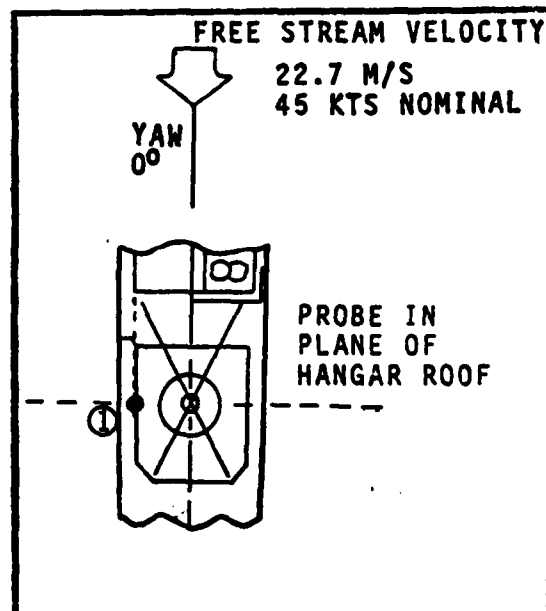
Figures 61 through 65 represent separate reanalysis of the Run 114 data, taking progressively shorter samples of the run (starting at its beginning each time), for analysis in the FFT program. Figure 60 uses about 6 1/4 seconds of the run (1024 samples analyzed); Figure 61, 512 samples; Figures 62-64, 128 samples or 0.8 seconds as in Figures 55-57; and finally Figure 65 represents analysis of only 0.4 seconds of the run containing 64 data samples. Amplitude growth with decreasing resolution is obvious.

Also apparent in the Figure 65 plot (in the 65-80 Hz range), is an FFT data anomaly called "picket fencing" (see Reference 3) which is due to having too low a resolution in the analysis. Increasing resolution, or adding zeroes to the end of a run under analysis helps remove this problem. The longer 128 sample run (Figure 62) appears to have removed picketing, but could undoubtedly be improved by using various types of "window" filter functions for smoothing.

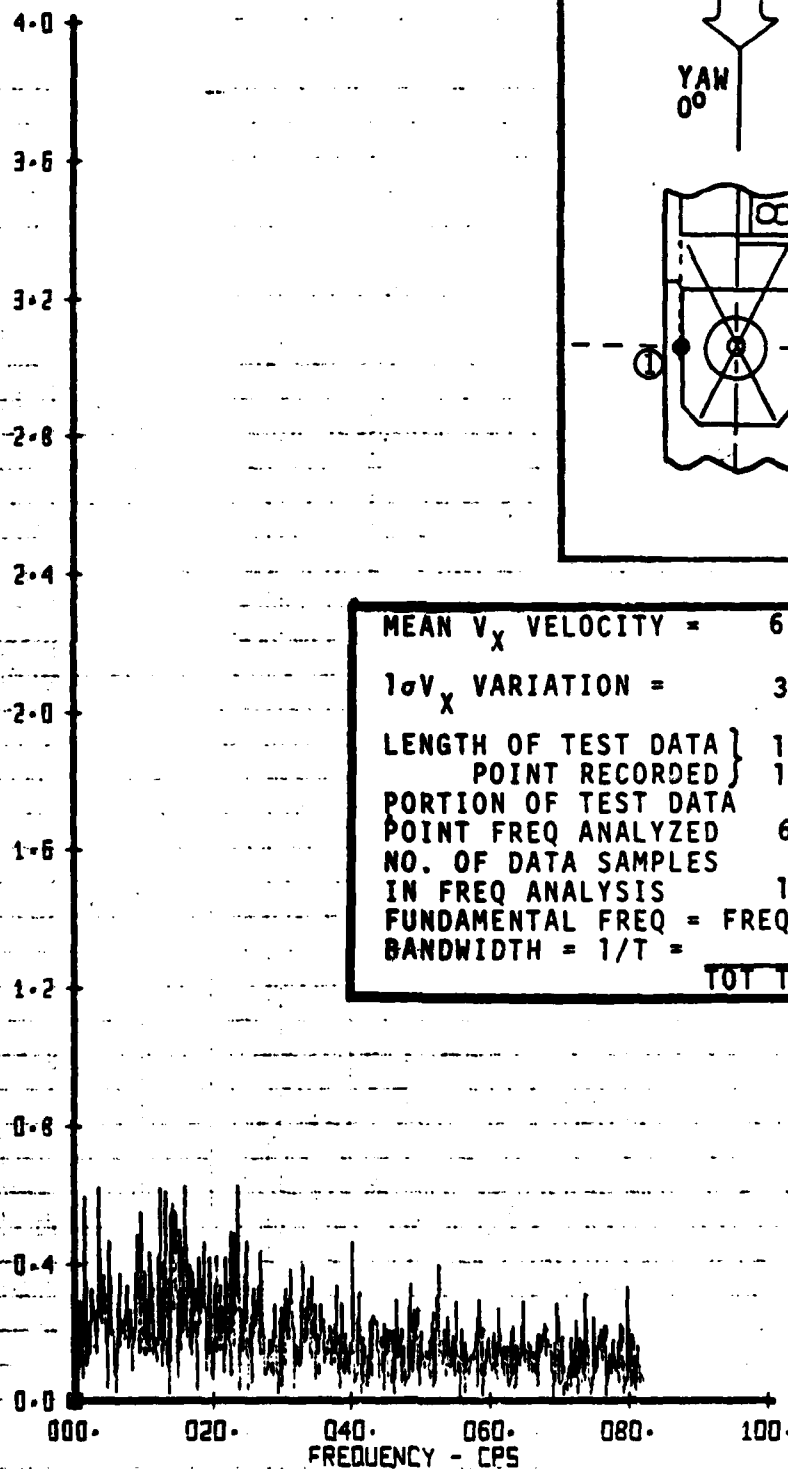
A third FFT data problem associated with frequency folding or aliasing, is prevented by sampling the data at twice the highest frequency present in the results. An attempt to do this was made in the DD 963 test, by providing 2 samples/cycle @ 80 Hz model scale (1 Hz full scale) which was expected to be much in excess of requirements. Scrutiny of 1/50 scale FF 1052 results showed little or no amplitude content above 50 Hz, so it was expected that the same condition would exist for the 1/80 scale DD 963 above 80 Hz.

SHIP WAKE VELOCITY SURVEY  
VX VS. FREQUENCY  
1024  
SAMPLES RUN 114 TP 1

LEGEND  
CH 1 PROBE 1



ALTERNATING VX AMPLITUDE - METERS/SEC



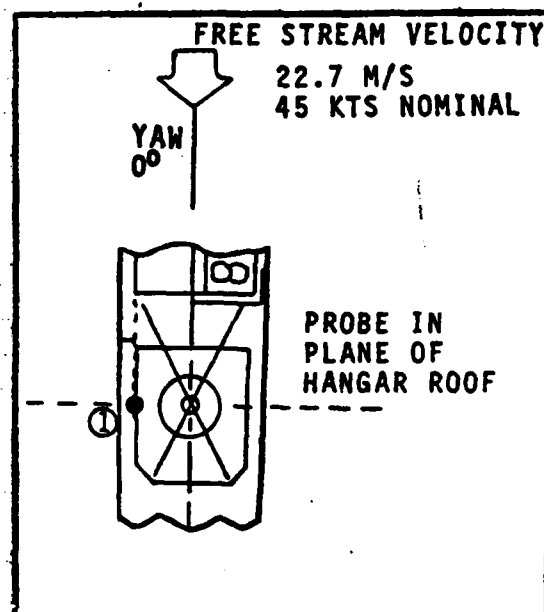
MEAN  $V_x$  VELOCITY = 6.61 M/S  
 $1\sigma V_x$  VARIATION = 3.41 M/S  
 LENGTH OF TEST DATA } 1705 SAMPLES  
 POINT RECORDED } 10.4 SEC  
 PORTION OF TEST DATA  
 POINT FREQ ANALYZED 6.25 SEC  
 NO. OF DATA SAMPLES  
 IN FREQ ANALYSIS 1024 SAMPLES  
 FUNDAMENTAL FREQ = FREQ RESOLUTION =  
 BANDWIDTH =  $1/T = 1$   
 TOT TIME ANAL = 0.16HZ

Figure 60.

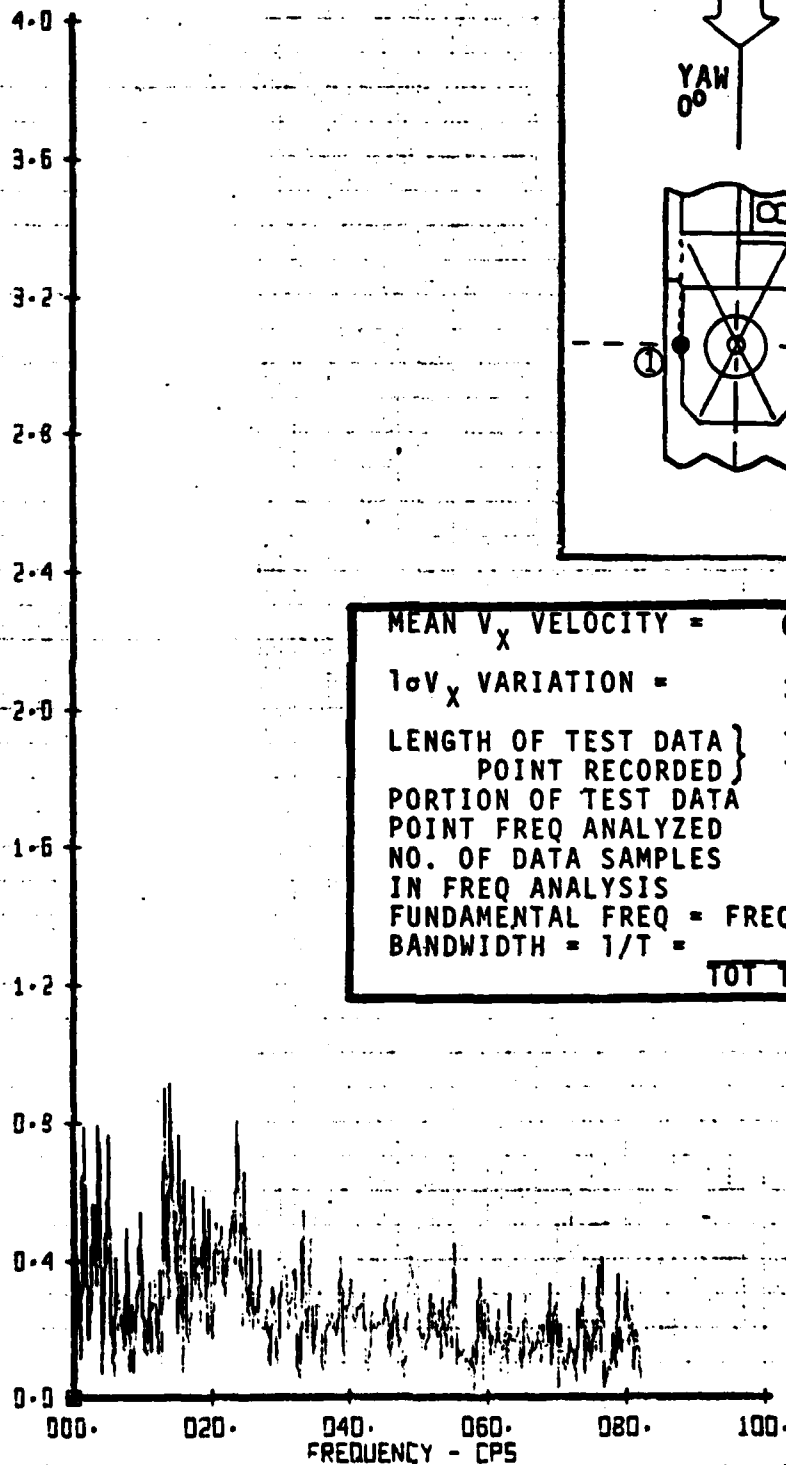
SHIP WAKE VELOCITY SURVEY  
512 SAMPLES -  $V_X$  VS. FREQUENCY  
RUN 114 TP 1

LEGEND

CH 1  
1 PROBE 1



ALTERNATING  $V_X$  AMPLITUDE - METERS/SEC



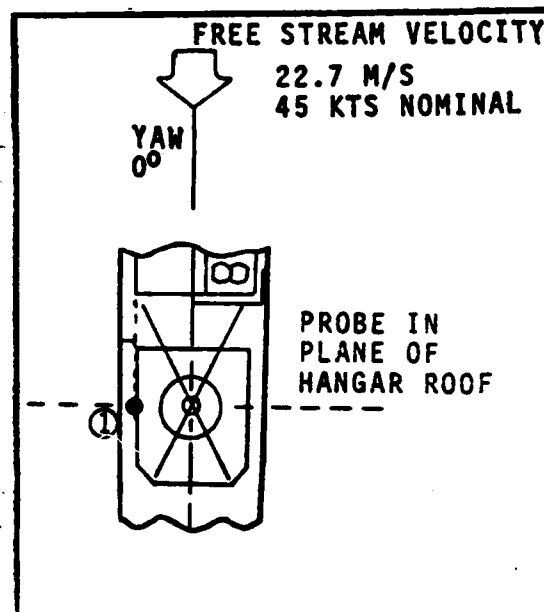
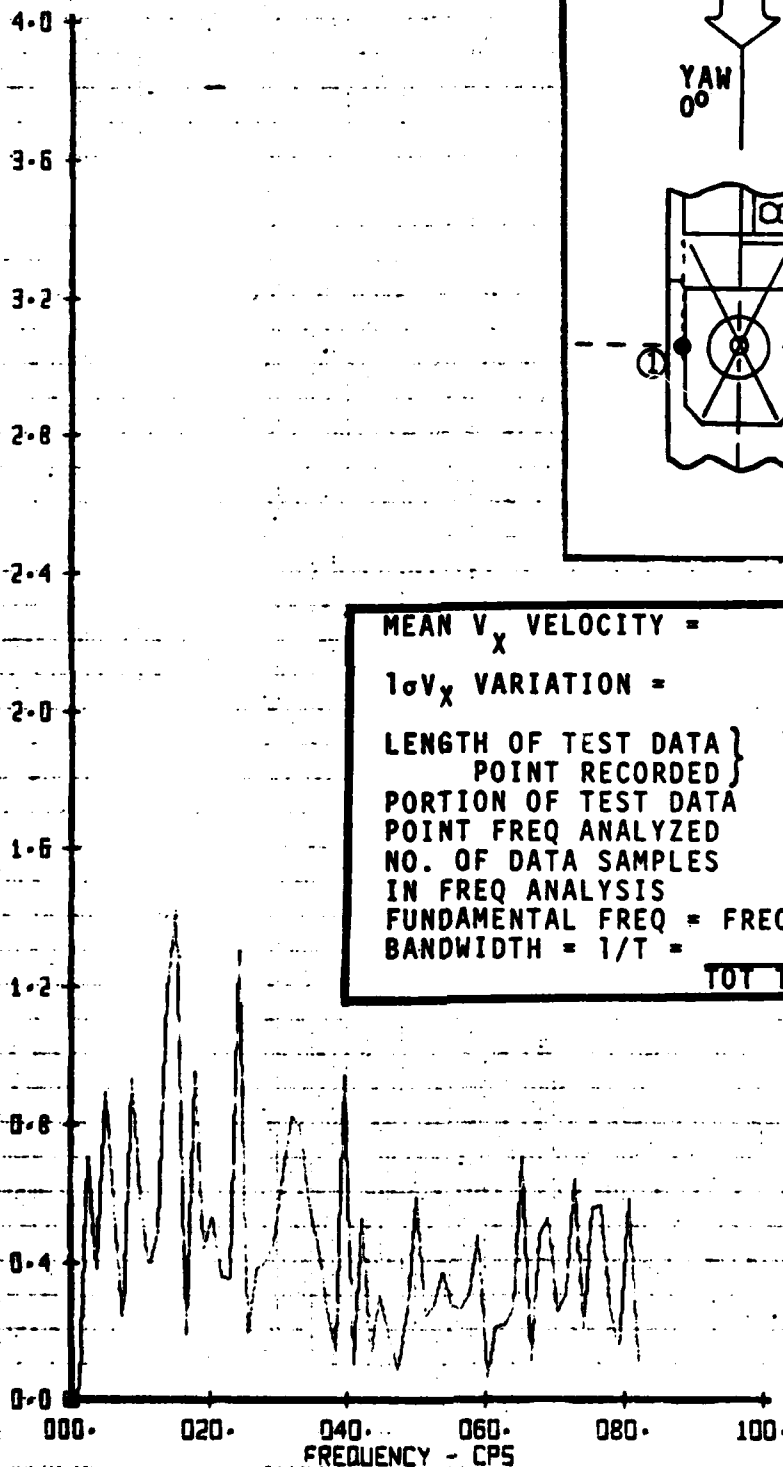
MEAN  $V_X$  VELOCITY = 6.61 M/S  
1- $V_X$  VARIATION = 3.41 M/S  
LENGTH OF TEST DATA } 1705 SAMPLES  
POINT RECORDED } 10.4 SEC  
PORTION OF TEST DATA  
POINT FREQ ANALYZED 3.12 SEC  
NO. OF DATA SAMPLES  
IN FREQ ANALYSIS 512 SAMPLES  
FUNDAMENTAL FREQ = FREQ RESOLUTION =  
BANDWIDTH =  $1/T$  = 1  
TOT TIME ANAL = 0.32HZ

Figure 61.

SHIP WAKE VELOCITY SURVEY  
128 SAMPLES - V<sub>X</sub> VS. FREQUENCY  
RUN 114 TP 1

LEGEND  
CH 1 PROBE 1

ALTERNATING V<sub>X</sub> AMPLITUDE - METERS/SEC



MEAN V<sub>x</sub> VELOCITY = 6.61 M/S  
1σV<sub>x</sub> VARIATION = 3.41 M/S  
LENGTH OF TEST DATA } 1705 SAMPLES  
POINT RECORDED } 10.4 SEC  
PORTION OF TEST DATA  
POINT FREQ ANALYZED 0.78 SEC  
NO. OF DATA SAMPLES  
IN FREQ ANALYSIS 128 SAMPLES  
FUNDAMENTAL FREQ = FREQ RESOLUTION =  
BANDWIDTH = 1/T = 1  
TOT TIME ANAL = 1.28HZ

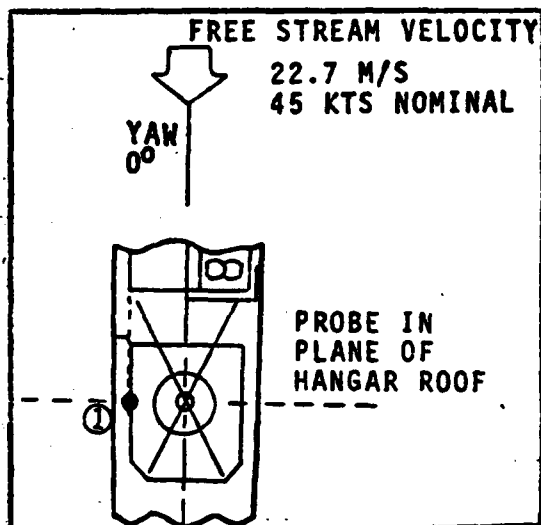
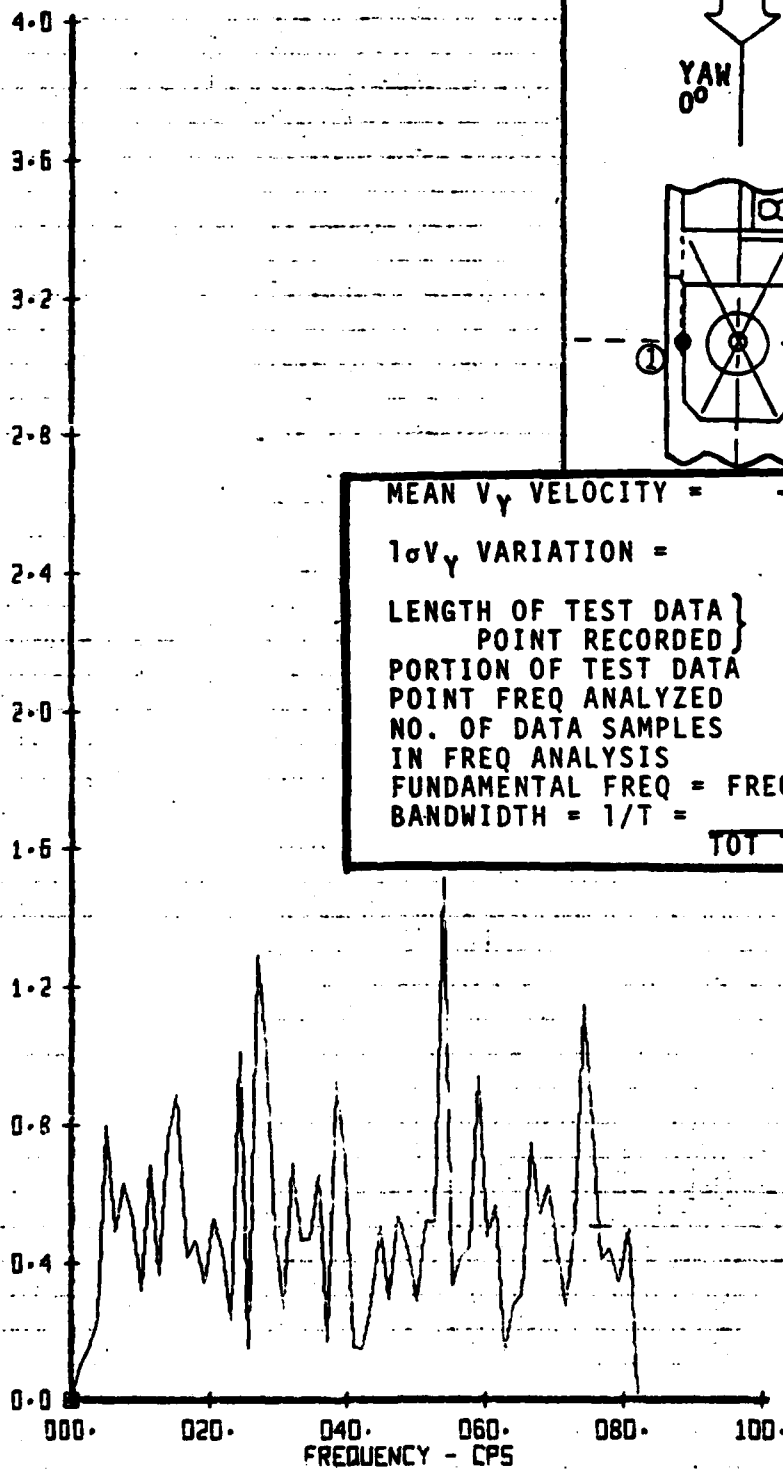
Figure 62.

SHIP WAKE VELOCITY SURVEY  
128 SAMPLES - VY VS. FREQUENCY  
RUN 114 TP 1

LEGEND

CH 1 PROBE 1

ALTERNATING VY AMPLITUDE - METERS/SEC



MEAN  $V_Y$  VELOCITY = -1.37 M/S  
 $1\sigma V_Y$  VARIATION = 3.17 M/S  
 LENGTH OF TEST DATA } 1705 SAMPLES  
 POINT RECORDED } 10.4 SEC  
 PORTION OF TEST DATA  
 POINT FREQ ANALYZED 0.78 SEC  
 NO. OF DATA SAMPLES  
 IN FREQ ANALYSIS 128 SAMPLES  
 FUNDAMENTAL FREQ = FREQ RESOLUTION =  
 BANDWIDTH =  $1/T = \frac{1}{10.4} = 0.096$   
 TOT TIME ANAL = 1.28HZ

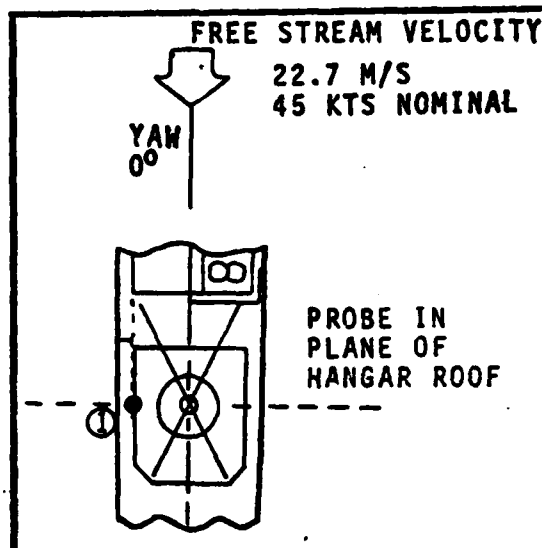
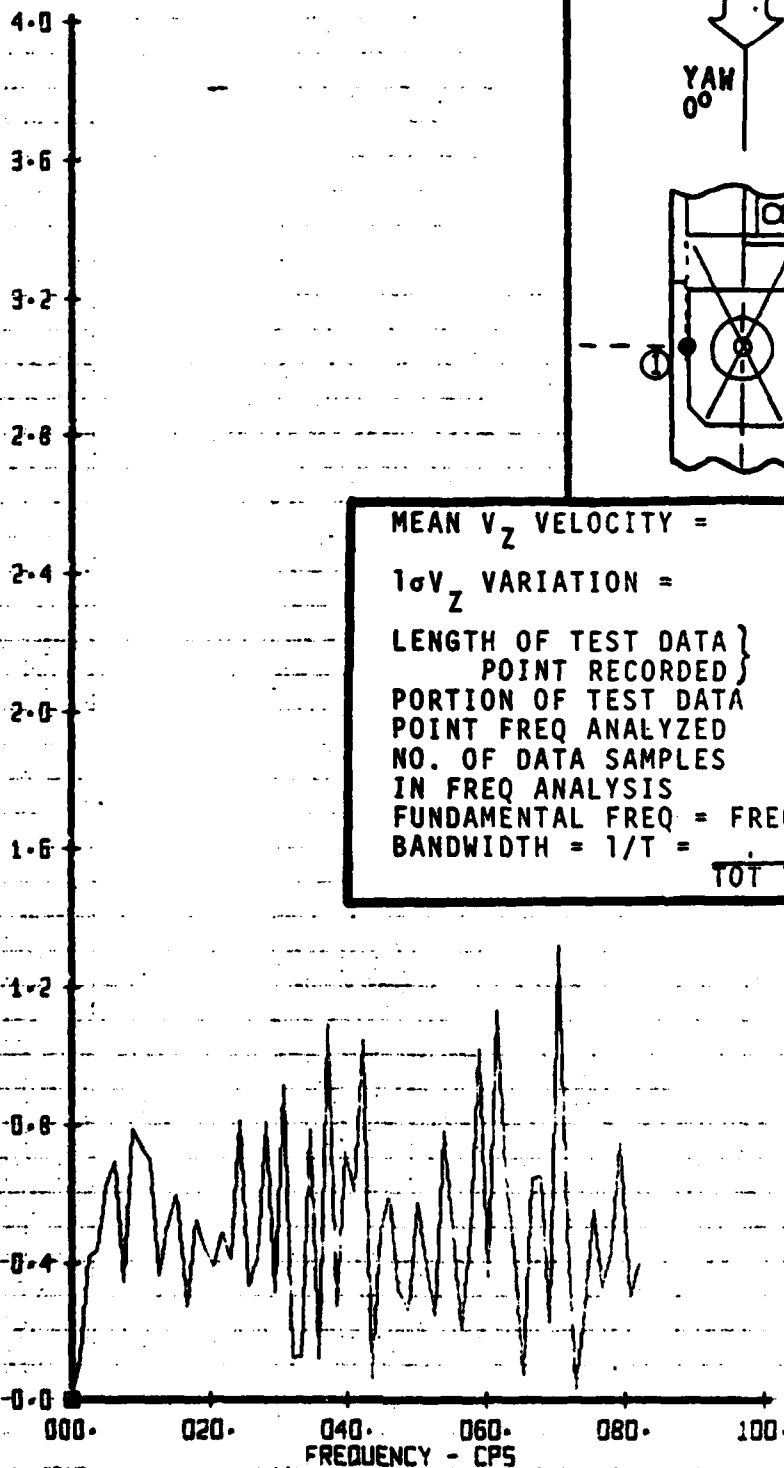
Figure 63.



SHIP WAKE VELOCITY SURVEY  
128 SAMPLES - VZ VS. FREQUENCY  
RUN 114 TP 1

LEGEND  
CH 1 PROBE 1

ALTERNATING VZ AMPLITUDE - METERS/SEC



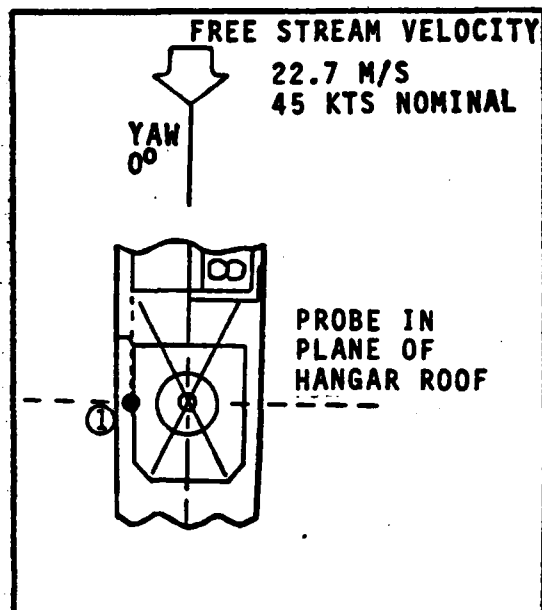
MEAN  $V_z$  VELOCITY = 0.34 M/S  
 $1\sigma V_z$  VARIATION = 3.40 M/S  
 LENGTH OF TEST DATA } 1705 SAMPLES  
 POINT RECORDED } 10.4 SEC  
 PORTION OF TEST DATA  
 POINT FREQ ANALYZED 0.78 SEC  
 NO. OF DATA SAMPLES  
 IN FREQ ANALYSIS 128 SAMPLES  
 FUNDAMENTAL FREQ = FREQ RESOLUTION =  
 BANDWIDTH =  $1/T = 1$   
 TOT TIME ANAL = 1.28HZ

Figure 64.

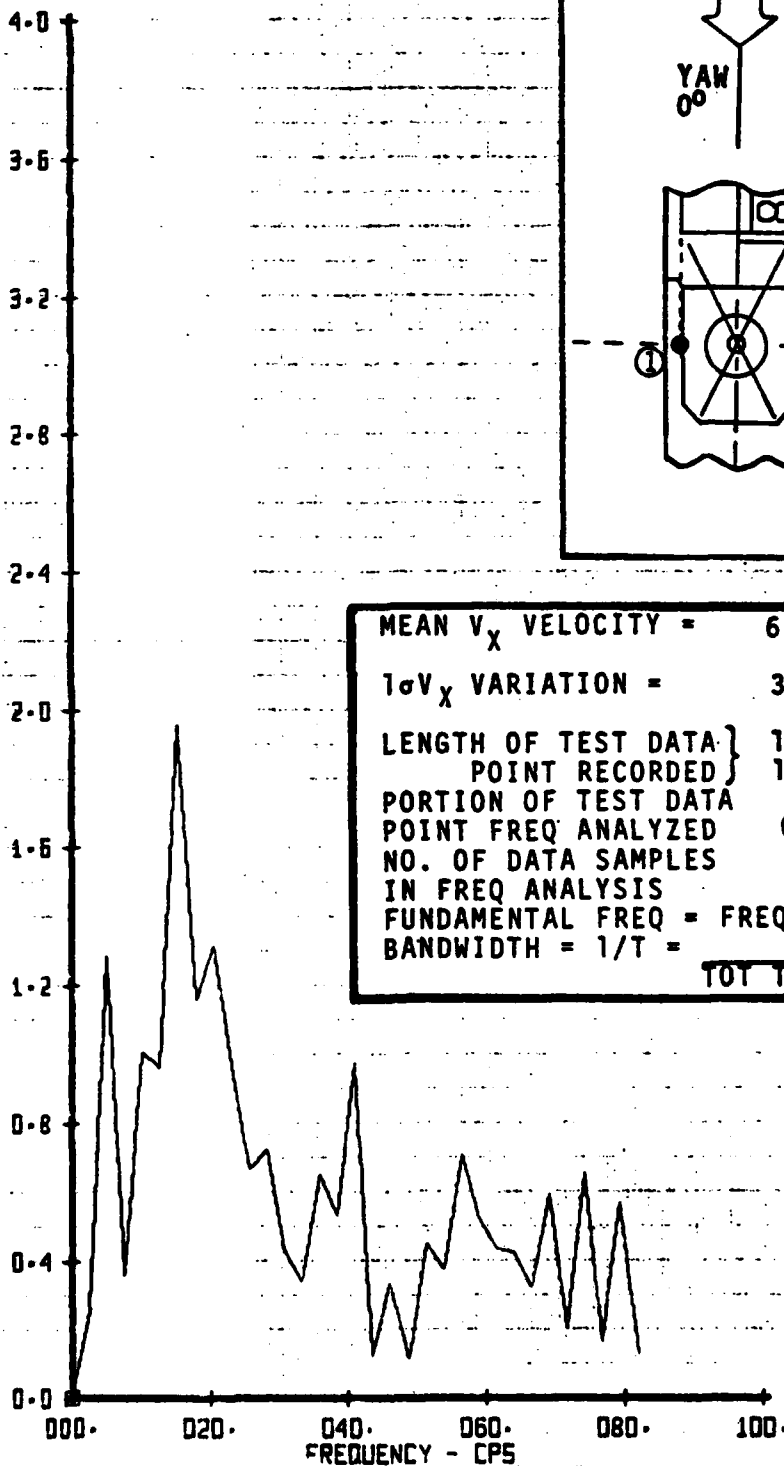
SHIP WAKE VELOCITY SURVEY  
64 SAMPLES -  $V_X$  VS. FREQUENCY  
RUN 114 TP 1

LEGEND

CH 1 PROBE 1



ALTERNATING  $V_X$  AMPLITUDE - METERS/SEC



MEAN  $V_X$  VELOCITY = 6.61 M/S  
1σ  $V_X$  VARIATION = 3.41 M/S  
LENGTH OF TEST DATA } 1705 SAMPLES  
POINT RECORDED } 10.4 SEC  
PORTION OF TEST DATA  
POINT FREQ ANALYZED 0.39 SEC  
NO. OF DATA SAMPLES  
IN FREQ ANALYSIS 64 SAMPLES  
FUNDAMENTAL FREQ = FREQ RESOLUTION =  
BANDWIDTH =  $1/T = \frac{1}{2.56} = 2.56\text{HZ}$

Figure 65.

For most cases, this was true - but for a few, significant amplitude content was observed at frequencies as high as 80 Hz; and the suspicion exists that some response was present beyond this point. If so, such data could be folded back (in a mirror image) on top of data on the lower side of 80 Hz; thereby adding to amplitudes around and below this frequency. If aliasing is, in fact, occasionally present in the data, its effects are probably not too serious since the alternating amplitudes in question (in the frequency range most likely for the phenomenon to occur) are not very large.

The potential for aliasing in future testing can be eliminated by low pass filtering the analog anemometer signals above the folding (or maximum desired) frequency (80 Hz in this case) or by increasing the sampling rate. The 164 sample/second/channel rate used for the DD 963 test, was for all practical purposes, the maximum which could have been selected based on computer data storage and total quantity of data desirable for analysis.

Before ending this frequency analysis discussion of DD 963 results, it is appropriate to point out that evaluating data shown in Figures 60-65 through use of a computed power spectral density parameter (which is normalized by dividing by the fundamental frequency- $\omega_0$ ), would probably have produced similar PSD plots for all the different sample lengths that showed approximately the same characteristics. This point is worth noting, since power density has been used in analyzing (and synthesizing) several of the airwake models developed in the past (Reference 4).

## SECTION 7.0 CONCLUSIONS

1. Three component dynamic velocity data time histories were successfully recorded on magnetic tape, to map the airwake turbulence flow field behind a 1/80 scale DD 963 Spruance Class Destroyer model at wind speeds of 20, 35, and 45 knots. Headwind, crosswind and tailwind conditions were evaluated for ship roll angles of 0 and + 15 degrees. Recorded time histories may be scaled to simulate full size ship airwake characteristics by applying Strouhal scaling laws which require only a simple (80:1) expansion of the time between recorded data samples.
2. Computed Mean velocity and 1 $\sigma$  Standard Deviation information was developed for all test points. These data indicate that the steady-state flow field behind the vessel is relatively stable and repeatable up to very high angles of yaw. Sample velocity vector maps were developed to graphically display the wake steady flow characteristics, in horizontal and vertical planes above, behind, and to either side of the ship.
3. A comparison of steady airwake components measured in both the DD 963 and FF 1052 wind tunnel programs indicates substantially larger areas of separated flow and turbulence behind the Destroyer. Frequency analysis of the DD 963 test data indicates a more constant level of periodic flow throughout the frequency band (without large increases at low frequency as expected) when compared to FF 1052 results. Both of these quantitative results were suggested by observations of the flow field made during the DD 963 flow visualization studies.
4. Steady-state velocity data recorded at 20, 35 and 45 knots showed similar trends in flow direction, and the magnitudes were found to be directly scalable with the remote wind speed. Accordingly, it should be possible to interpolate freely between results at any of these velocities to develop required data at speeds not measured.
5. Application of either (a) Strouhal scaled dynamic velocity time history data directly, or (b) steady-state results with some type of computed random turbulence function appears to be a feasible approach for developing an airwake math model suitable for helicopter/VSTOL aircraft development, or for piloted flight simulation work. Further in-depth analysis of the test results is required to produce math models of the turbulence, suitable for the intended tasks.

RESEARCH AND ANALYSIS - NOT ELABORATED

#### SECTION 8.0 REFERENCES

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3. Bergland, G. D., "A Guided Tour of the Fast Fourier Transform," IEEE Spectrum, July 1969.
4. Nave, Ronald L., "Development and Analysis of a CVA and a 1052 Class Fast Frigate Air Wake Model," Naval Air Development Center, Warminster, Pa., report number NADC-78182-60, September 30, 1978.
5. Fortenbaugh, R. L., "Mathematical Models for the Aircraft Operational Environment of DD 963 Class Ships," Vought Corporation, Dallas, Texas, report number 2-55800/BR-3500, September 26, 1978.
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7. Contract Number N68335-79-C-1002, "Wind Tunnel Survey of the Close-in Airwake Turbulence Behind a DD 963 Destroyer Model," issued by Naval Air Engineering Center, Lakehurst, N.J., January 25, 1979.
8. "Pre-Test Briefing for DD 963 Airwake (NADC) and Close-in (NAEC) Wake Turbulence Test," report from Boeing Vertol Company, Philadelphia, Pa., 1979.
9. Anonymous, "Specification Sheet for the TSI System 1080 Total Vector Anemometer," Thermo Systems Inc. of St. Paul, Minnesota, revised June 1972.
10. Anonymous, "Data Reduction Procedure for the 1080 Total Vector Anemometer," Thermo Systems Inc. Technical Bulletin No. 7, May 1, 1970.
11. Sarchin, T. H. and Goldberg, L. L., "Stability and Buoyancy Criteria for U.S. Naval Surface Ships," The Society of Naval Architects and Marine Engineers, N.Y., N.Y., November 1962.
12. Garnett Jr., Theodore S., "Wind Tunnel Survey of the Close-In Airwake Turbulence Behind a DD 963 Destroyer Model," Boeing Vertol Company of Philadelphia, Pennsylvania, December 1979.

APPENDIX A  
RUN LOG FOR DD 963 AIRWAKE TURBULENCE TEST  
BVWT 242/243

RECEIVED AND INDEXED - NOT RECORDED

PREP	CHK.	APPR	REVISED	DATE	RUN NO.	CONFIGURATION	TYPE OF RUN	WT. TARE RUN	PROB. ARMY	$\phi^\circ$	$\psi^\circ$	SPD KTS	q	TP's	RANGE CODE	DATE / TIME	
					1	DD963 DESTROYER	Flow viz	-	-	0	1	20	1.36	-	-	4-18-79 1845	
					2		✓	-	-	✓	2	✓	✓	-	-	1949	
					3		✓	-	-	+15	1	✓	✓	-	-	2002	
					4		✓	-	-	✓	2	✓	✓	-	-	2113	
					5		✓	-	-	-15	1	✓	✓	-	-	2233	
					6		✓	-	-	✓	2	✓	✓	-	-	2304	
					7	+ BUBBLE GENERATOR	✓	-	-	0	3	✓	✓	-	-	2337	
					8		✓	-	1	✓	0	-	-	-	-	0029	
					9		✓	-	✓	✓	4	20	1.36	-	-	4-29 1310	
					10		✓	-	✓	✓	9	30	0.05	-	-	1552	
					<p>1. NAME, STATUS, STAGE PICTURES WITH PROBE AT VARIOUS LAKE E. MUDAL STATION</p> <p>2. ROLLED MULL CONEG 15° TO 1815</p> <p>3. FLOW VIZ Q = 30, ONLY</p> <p>4. BUBBLE GENERATOR PIX</p> <p>5. FLOW VIZ Q = 30, ONLY</p> <p>6. BUBBLE GENERATOR PIX</p> <p>7. FLOW VIZ Q = 30, ONLY</p> <p>8. BUBBLE GENERATOR PIX</p> <p>9. FLOW VIZ Q = 30, ONLY</p> <p>10. BUBBLE GENERATOR PIX</p>												

SHIPWAKE TEST  
DD963 DESTROYER

BVWT  
242

PREP	CHK.	APPR	REVISD	DATE	CONFIGURATION	TYPE OF TARE RUN	WT. TARE RUN	PROBE ARRAY	$\phi^\circ$	$\psi^\circ$	SPEED KTS	q	TPS	BAKE CAL. LOC/H	CAL. POINT	DATE / TIME
					DD 963	✓	-	1	0	4	45	6.16		1		2-30-79
					✓	✓		✓	✓	9.30	✓	✓	10%	✓		1043
					✓	✓		✓	✓	5	20	1.36		2		1100
					✓	✓		✓	✓	✓	30	3.05		✓		1114
					✓	✓		✓	✓	✓	45	6.86		✓		1118
					✓	✓		✓	✓	✓	20	1.36		3	YES	1127
					✓	✓		✓	✓	✓	30	3.05		✓		1151
					✓	✓		✓	✓	✓	45	6.16		✓		1157
					✓	✓		✓	✓	✓	20	1.36		4	YES	1203
					✓	✓		✓	✓	✓	35	4.16		✓		1325
					✓	✓		✓	✓	✓				✓		1336
11																
12																
13																
14																
15																
16																
17																
18																
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20																
110																
111																
112																
113																
114																
115																
116																
117																
118																
119																
120																

AFTER DECK GUN REPLACED

WAS NOT TO SET RUN

21 0, +30, +50  
 22 0, +30, +50, +90  
 23 0, +30, +50, +90

BVWT  
 242







PREP	CHK.	APPR	RUN NO.	CONFIGURATION	TYPE OF RUN	WT. TARE RUN	WT. PROBE RUN	Φ°	ψ°	SPEED KIS	q	TP	PAKE LOCH	CAL RUNT	DATE / TIME
			41	DD963	AIR WAKE	-	1	-15	3	45	6.76	REG	3	-	3.30.77
			42	✓	-	-	-	-	3	20	1.36	-	4	Yes	2118
			43	✓	-	-	-	-	-	45	6.86	-	-	-	2137
			44	✓	-	-	-	-	2	20	1.36	-	5	Yes	2144
			45	✓	-	-	-	-	-	45	6.86	-	-	-	2110
			46	MODEL OUT OF TUNNEL	-	-	-	-	0	20	1.36	-	1	Yes	
			47	DD963	-	-	-	0	3	-	1.36	-	-	-	2237
			48	✓	-	-	-	-	-	20	1.36	-	-	Yes	
			49	✓	-	-	-	-	-	35	4.8	-	-	-	
			50	✓	-	-	-	-	-	45	6.86	-	-	-	
<p>47 REPEAT OF RUN 7</p> <p>48 REMOVED MAT BECK GUN</p> <p>47 PROBE 4</p> <p>47 STATED THIS WAY THRU TUNNEL</p> <p>CHANNEL 25 INTERMITTENT WHEN TO</p> <p>"HIS SPEED" DATA COMPARED FAVORABLY</p>															

BYWT

242



PREP.	CHK.	APPR.	RUN NO.	CONFIGURATION	TYPE OF TARE RUN	WT. TARE RUN	WT. TARE RUN	$\phi^\circ$	$\psi^\circ$	V	q	TP	DATE LOC.	CAL PT.	DATE / TIME
			61	DD 963	✓	-	2	0	✓	20	1.36	REG.	5	YES	4-2-77
			62	✓	✓			✓	✓	35	4.16	✓	✓	-	1115
			63	✓	✓			✓	✓	45	6.16	✓	✓	-	1122
			64	✓	✓			✓	✓	✓	✓	REG.	✓	-	1338
			65	✓	✓			-15	✓	20	1.36	REG.	✓	YES	1448
			66	✓	✓			✓	✓	45	6.16	✓	✓	-	1450
			67	✓	✓			✓	✓	20	1.36	✓	4	YES	1456
			68	✓	✓			✓	✓	45	6.16	✓	✓	-	1501
			69	✓	✓			✓	✓	20	1.36	✓	3	YES	1537
			70	✓	✓			✓	✓	45	6.16	✓	✓	-	1542
															1544
															1540

1115 1122 1338 1448 1450 1456 1501 1537 1542 1544 1540

1115 1122 1338 1448 1450 1456 1501 1537 1542 1544 1540

PREP.	CHK.	APPR.	RUN NO.	CONFIGURATION	TYPE OF RUN	WT. TARE RUN	PODE ARRAY	$\phi^\circ$	$\psi^\circ$	V	$\eta$	TP	RACE LOC.	CAL. PT.	DATE / TIME
			71	3D963	ARE WAKE		2	-15	5	20	1.36	REG.	2	YES	1348
			72	✓	✓		✓	✓	✓	45	6.86	✓	✓	-	1357
			73	✓	✓		✓	✓	✓	20	1.36	✓	1	YES	1401
			74	✓	✓		✓	✓	✓	45	6.86	✓	✓	-	1415
			75	✓	✓		✓	+15	✓	20	1.36	✓	✓	YES	1430
			76	✓	✓		✓	✓	✓	45	6.86	✓	✓	-	1450
			77	✓	✓		✓	✓	✓	20	1.36	✓	2	YES	1456
			78	✓	✓		✓	✓	✓	45	6.86	✓	✓	-	1500
			79	✓	✓		✓	✓	✓	20	1.36	✓	3	YES	1507
			80	✓	✓		✓	✓	✓	45	6.86	✓	✓	-	1512
															1523
															1530

3 RUN 711 15 MAY 70







PREP	CHK.	APPR	RUN NO.	CONFIGURATION	TYPE OF RUN	WT. TARE RUN	PROG. ARRAY	$\Phi^\circ$	$\psi^\circ$	V Kts.	T.P. REF	PROG. LOC.	CAL PT.	DATE / TIME
			101	DD 963	AIR WARE	-	4	+15	11	20	136	2	YES	4/3/79
			102	✓	✓		✓	✓	✓	✓	✓	✓	✓	0800
			103	✓	✓		✓	✓	✓	✓	✓	1	✓	0815
			104	✓	✓		✓	-15	✓	✓	✓	✓	✓	0905
			105	✓	✓		✓	✓	✓	✓	✓	2	✓	1015
			106	✓	✓		✓	✓	✓	✓	✓	3	✓	1027
			107	✓	✓		✓	✓	✓	✓	✓	4	✓	1032
			108	✓	✓		✓	✓	✓	✓	✓	5	✓	1042
			109	✓	✓		✓	+15	✓	✓	✓	2	✓	1057
			110	✓	✓		✓	✓	✓	✓	✓	1	✓	1101

101 CAL PT - 0010

102 5 DATA PDS - RUN ABORTED

103 RPT 101 WITH 15 PDS RELEASED AT 1157

102	1167	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170	1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185	1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200	1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215	1216	1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230	1231	1232	1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245	1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260	1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275	1276	1277	1278	1279	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	1290	1291	1292	1293	1294	1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305	1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320	1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335	1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350	1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	1364	1365	1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380	1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395	1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425	1426	1427	1428	1429	1430	1431	1432	1433	1434	1435	1436	1437	1438	1439	1440	1441	1442	1443	1444	1445	1446	1447	1448	1449	1450	1451	1452	1453	1454	1455	1456	1457	1458	1459	1460	1461	1462	1463	1464	1465	1466	1467	1468	1469	1470	1471	1472	1473	1474	1475	1476	1477	1478	1479	1480	1481	1482	1483	1484	1485	1486	1487	1488	1489	1490	1491	1492	1493	1494	1495	1496	1497	1498	1499	1500	1501	1502	1503	1504	1505	1506	1507	1508	1509	1510	1511	1512	1513	1514	1515	1516	1517	1518	1519	1520	1521	1522	1523	1524	1525	1526	1527	1528	1529	1530	1531	1532	1533	1534	1535	1536	1537	1538	1539	1540	1541	1542	1543	1544	1545	1546	1547	1548	1549	1550	1551	1552	1553	1554	1555	1556	1557	1558	1559	1560	1561	1562	1563	1564	1565	1566	1567	1568	1569	1570	1571	1572	1573	1574	1575	1576	1577	1578	1579	1580	1581	1582	1583	1584	1585	1586	1587	1588	1589	1590	1591	1592	1593	1594	1595	1596	1597	1598	1599	1600	1601	1602	1603	1604	1605	1606	1607	1608	1609	1610	1611	1612	1613	1614	1615	1616	1617	1618	1619	1620	1621	1622	1623	1624	1625	1626	1627	1628	1629	1630	1631	1632	1633	1634	1635	1636	1637	1638	1639	1640	1641	1642	1643	1644	1645	1646	1647	1648	1649	1650	1651	1652	1653	1654	1655	1656	1657	1658	1659	1660	1661	1662	1663	1664	1665	1666	1667	1668	1669	1670	1671	1672	1673	1674	1675	1676	1677	1678	1679	1680	1681	1682	1683	1684	1685	1686	1687	1688	1689	1690	1691	1692	1693	1694	1695	1696	1697	1698	1699	1700	1701	1702	1703	1704	1705	1706	1707	1708	1709	1710	1711	1712	1713	1714	1715	1716	1717	1718	1719	1720	1721	1722	1723	1724	1725	1726	1727	1728	1729	1730	1731	1732	1733	1734	1735	1736	1737	1738	1739	1740	1741	1742	1743	1744	1745	1746	1747	1748	1749	1750	1751	1752	1753	1754	1755	1756	1757	1758	1759	1760	1761	1762	1763	1764	1765	1766	1767	1768	1769	1770	1771	1772	1773	1774	1775	1776	1777	1778	1779	1780	1781	1782	1783	1784	1785	1786	1787	1788	1789	1790	1791	1792	1793	1794	1795	1796	1797	1798	1799	1800	1801	1802	1803	1804	1805	1806	1807	1808	1809	1810	1811	1812	1813	1814	1815	1816	1817	1818	1819	1820	1821	1822	1823	1824	1825	1826	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840	1841	1842	1843	1844	1845	1846	1847	1848	1849	1850	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860	1861	1862	1863	1864	1865	1866	1867	1868	1869	1870	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	
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PREP.	CHK.	APPR.	REVISD	DATE	DATE / TIME 4-3-79	CAL PT.	NO. OF LOC.	T.P. REG.	Q P.F.	V KTS	ψ	φ	WT. OF TARE RUN	TYPE OF RUN	CONFIGURATION	RUN NO.
					1423	YES	1	REG.	1.36	20	12	0		ARC WIRE	2D 563	111
					1441	-	✓	✓	4.16	35	✓	✓	✓	✓	✓	112
					1444	-	✓	✓	6.86	45	✓	✓	✓	✓	✓	113
					1447	-	✓	10%L	✓	45	13	✓	✓	✓	✓	114
					1457	✓	2	REG.	1.36	20	11	✓	✓	✓	✓	115
					1503	-	✓	✓	6.86	45	✓	✓	✓	✓	✓	116
					1511	✓	3	✓	1.36	20	✓	✓	✓	✓	✓	117
					1520	-	✓	✓	6.86	45	✓	✓	✓	✓	✓	118
					1527	YES	4	✓	1.36	20	10	✓	✓	✓	✓	119
					1532	-	✓	✓	6.86	45	✓	✓	✓	✓	✓	120

TABLE 3: 2004-2014

PREP.

CHK.

APPR.

REVISD

DATE

BVWT

242



132

PREP	CHK.	APPR	RUN NO.	CONFIGURATION	TYPE OF TARE RUN	WT. TARE RUN	PROG. APPR. LOGN	$\phi^\circ$	$\psi^\circ$	V KGS	q Tsf	TP	CAL. PT.	DATE / TIME
			134	DD 963	CLOSE IN		1	0	15	20	1.36	REG	YES	4/3/79 2207
			135	✓	✓		✓	✓	✓	45	6.86	✓	-	2220
			136	✓	✓		✓	✓	✓	✓	10500	✓	-	2233
			137	✓	✓		✓	✓	✓	20	1.36	REG	YES	2236
			138	✓	✓		✓	✓	✓	45	6.86	✓	-	2300
			139	✓	✓		✓	✓	✓	20	1.36	✓	YES	2320
			140	✓	✓		✓	✓	✓	45	6.86	✓	-	2334
			141	✓	✓		✓	✓	✓	20	1.36	✓	YES	2345
			142	✓	✓		✓	✓	✓	45	6.86	✓	-	0002
			143	✓	✓		✓	✓	✓	20	1.36	✓	-	0014
										45	6.86	✓	YES	0022
										20	1.36	✓	-	0037
										45	6.86	✓	-	0055
										20	1.36	✓	-	0101

134 BEGIN CLOSE-IN TEST PHASE APPLY 1 AS FOLLOWS:

135  $\psi = 0, 10, -10$

136  $\psi = 0, 10, -10$  SEC BURST

137  $\psi = 0, 10, 30, 50, 0, -10, -30, -50$

138 11.11 WHEN WHITE MODEL MOVING

139  $\psi = 0, 10, 30, 50, 150, 170, 190$



PREP.	CHK.	APPR.	REVISD	DATE	RUN NO.	CONFIGURATION	TYPE OF RUN	WT. TARE RUN	PROBE ADJUST	PROBE LOC.	$\phi^\circ$	$\psi^\circ$	V MS	q MS	TP	CAL. PT.	DATE / TIME
					144	DD 963	CLOSE IN	-	1	5	0	$\Delta$	45	6.86	REG	-	4.4.79
					145	✓	✓	-	✓	4	+15	$\Delta$	20	1.36	✓	YES	0904 0214 0111
					146	✓	✓		✓	✓	✓	✓	45	6.86	✓	-	0940 0916 0946
					147	✓	✓		✓	3	✓	✓	20	1.36	✓	-	0956
					148	✓	✓		✓	✓	✓	✓	45	6.86	✓	-	1005
					149	✓	✓		✓	2	✓	✓	20	1.36	✓	-	1012
					150	✓	✓		✓	✓	✓	✓	45	6.86	✓	-	1013
					151	✓	✓		2	✓	✓	✓	20	1.36	✓	YES	1000
					152	✓	✓		✓	✓	✓	✓	45	6.86	✓	-	1111
					153	✓	✓		✓	3	✓	✓	20	1.36	✓	-	1121

RUN 150 CLOSE UNDER 149  
 RUN 148 ON 145 - 2057 WITH  
 PROBE 175 (CHECKED WITH  
 FROM 148) WHICH NEVER MOVED

PREP	CHK.	APPR	REVISED	DATE	RUN NO.	CONFIGURATION	TYPE OF RUN	WT. TARE RUN	PODE AWAY	PODE LAC.	Φ	ψ	V	g	TP	CAL PT.	DATE / TIME
					154	DD 963	CURE IN	-	2	3	+15	17	45	6.86	REFL	-	1124
					155	✓	✓	-	✓	4	✓	✓	20	1.36	✓	YES	1136
					156	✓	✓	-	✓	✓	✓	✓	45	6.86	✓	-	1139
					157	✓	✓	-	✓	✓	0	✓	20	1.36	✓	YES	1146
					158	✓	✓	-	✓	✓	✓	✓	45	6.86	✓	-	1154
					159	✓	✓	-	✓	5	✓	17	20	1.36	✓	YES	1248
					160	✓	✓	-	✓	✓	✓	✓	45	6.86	✓	-	1304
					161	✓	✓	-	✓	3	✓	17	20	1.36	✓	YES	1310
					162	✓	✓	-	✓	✓	✓	✓	45	6.86	✓	-	1323
					163	✓	✓	-	✓	2	✓	✓	20	1.36	✓	-	1343
																	1357
																	1410
																	1421
																	1425

161 - 163 HI - 5720 DATA STATED  
IS RAIL - WAS ACTUALLY  
P. ROW AS LOGGED.





PREP.	CHK.	APPR.	REVISD	DATE	RUN NO.	CONFIGURATION	TYPE OF TARE RUN	WT. TARE RUN	PROBE ARRAY	IRIDE LOC.	Φ°	ψ	V KIS	q P&F	TP	CAL PT	DATE / TIME
					173	DD 963	TAIL WIND	-	4	3C	0°	31	45	6.86	REG	-	4-5-79
					174	✓	✓	-	✓	4C	✓	✓	20	1.36	✓	-	1002
					175	✓	✓	-	✓	✓	✓	✓	45	6.86	✓	-	1009
					176	✓	✓	-	✓	5C	✓	✓	20	1.36	✓	-	1017
					177	✓	✓	-	✓	✓	✓	✓	45	6.86	✓	-	1022
					178	✓	✓	-	✓	3A	✓	✓	20	1.36	✓	-	1037
					179	✓	✓	-	✓	3A	✓	✓	45	6.86	✓	YES	1032
					180	✓	✓	-	✓	3A	✓	✓	20	1.36	✓	YES	1040
					181	✓	✓	-	✓	✓	✓	✓	45	6.86	✓	-	1100
					182	✓	✓	-	✓	4C	✓	✓	20	1.36	✓	-	1112
																	1123
																	1129
																	1133
																	1137

200128 ARRAY 3, 5, 15 ARRAY 4, 0 HANGAR DECK HEIGHT (1.875 METER TRAIL 4)

- 3.2 M ABOVE LANDING DECK

\* REFERRED TO AS BEING CONSIDERATION 2

IN TABLES 1 AND 2

PREP.	CHK.	APPR.	REVISD	DATE	RUN NO.	CONFIGURATION	TYPE OF RUN	WT. TARE RUN	WT. ROBE	ROBE LOC	$\phi$	$\psi$	V KTS	q PSF	TP.	COL PT.	DATE / TIME
					183	30 963	TAIL WIND	-	3.5	4C	0°	$\triangle$	45	6.86	REG	YES	4-5-79
					184	✓	✓	-	✓	3C	✓	✓	20	1.36	✓	YES	1441 No. 1
					185	✓	✓	-	✓	✓	✓	✓	45	6.86	✓	-	1319
					186	✓	✓	-	✓	2C	✓	$\triangle$	20	1.36	✓	-	1335
					187	✓	✓	-	✓	✓	✓	✓	45	6.86	✓	-	1349
					188	✓	✓	-	✓	1C	✓	$\triangle$	20	1.36	✓	-	059
					189	✓	✓	-	✓	✓	✓	✓	45	6.86	✓	-	1422
					190	✓	✓	-	✓	1A	+15	$\triangle$	20	1.36	✓	-	1437
					191	✓	✓	-	✓	2A	✓	$\triangle$	✓	✓	✓	YES	1505
					192	✓	✓	-	✓	3A	✓	✓	✓	✓	✓	-	1521
																	1537
																	1643
																	1657

190-184 ALL PROBES CHECKED ELECTRICALLY

195 YAW LIMITS CUT DOWN DUE TO PROXIMITY OF SENSING ELEMENTS TO DECELERATOR

195  $\psi = 180, 180, 180, 180, 180, 180$

195  $\psi = 180, 180, 180, 180, 180, 180$

195  $\psi = 180, 180, 180, 180, 180, 180$

PREP.	CHK.	APPR.	REVIS	DATE	RUN NO.	CONFIGURATION	TYPE OF RUN	WT. TARE RUN	PROBE AGENT	PROBE LOC.	Φ°	ψ	V KIS	q PSF	TP	CAL. PT.	DATE / TIME
					193	DD 963	TAIL WIND	-	3,5	3A	-15	21	20	1.36	REG	Yes	4/5/79
					194	✓	✓	-	✓	2A	✓	✓	✓	✓	✓	-	1710
					195	✓	✓	-	✓	1A	✓	✓	✓	✓	✓	-	1721
					196	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	-	1735
					197	✓	✓	-	✓	2A	✓	✓	✓	✓	✓	-	1748
					198	✓	✓	-	✓	3A	✓	✓	✓	✓	✓	-	1759
					199	✓	✓	-	✓	3A +15	✓	✓	✓	✓	✓	Yes	1811
					200	✓	✓	-	✓	2A	✓	✓	✓	✓	✓	-	1830
					201	✓	✓	-	✓	1A	✓	✓	✓	✓	✓	-	1846
					202	✓	✓	-	✓	✓	0	✓	20	✓	✓	Yes	1856

196. ARRAY 6 AS ARRAY 4 (RUN 191) BUT AT 6.12 ABOVE LANDING SECT

1. REFERRED TO AS HIGH CONVECTION 7  
IN TABLES 1 AND 2

BVWT  
243



APPENDIX B

STEADY STATE AERODYNAMIC VELOCITY  
DISTRIBUTION IN THE WAKE OF A DD 963  
SPRUANCE CLASS DESTROYER -  
CALCULATED MEAN AND STANDARD DEVIATION DATA

Time history data recorded during the DD 963 Aerodynamic Airwake Test was processed to derive steady-state Mean X, Y, and Z velocity components for each test point, and the Standard Deviation about the Mean. Standard Deviation was computed after first calculating Mean and Root Mean Square values for each 0.8 or 10.4 second segment of data, and then applying the formula

$$\sigma = \sqrt{\sum \frac{X^2}{N} - \left(\frac{\sum X}{N}\right)^2}$$

or

$$\text{Standard Deviation} = \sqrt{(\text{RMS})^2 - (\text{Mean})^2}$$

In the tabular data listings presented in this appendix, run number is given first (corresponding to the left hand column in the Appendix A Run Log), followed by nominal free stream tunnel velocity (expressed in meters per second), and ship roll angle. Following these parameters are the test point designation, ship yaw angle, and probe number.

Probe locations corresponding to the probe number are defined in the next three columns, using full scale dimensions (meters) relative to the centerline of the helicopter flight platform bullseye. Plus "X" values are aft of the pad C with plus "Y" to the left, and plus "Z" above the landing pad deck. Probe array locations are also described in the Appendix A Run Log, and in Section 5.0.

Mean Vx, Vy and Vz data columns represent the average longitudinal, lateral, and vertical velocity components (expressed in meters per second) at each probe location for all test points. Sign convention is as follows:

- Positive (+) Vx rearward
- Positive (+) Vy to the left looking forward
- Positive (+) Vz upward

Data listed in the last three columns represent the Standard Deviation about each of the mean velocity components.

The tabulated test results presented in this appendix have been edited to remove duplicate runs and repeat test points (such as the last test point in each data sweep where the ship was returned to zero degrees yaw angle to check data repeatability).

In addition to this editing process, Table 3 is presented before the listings to indicate cases where probes were inoperative (but may still appear in the listings - note that probes 4 and 6 occasionally fall into this category). The table also points out cases where test conditions did not agree with those outlined in Table 1 in Section 5.

TABLE 3  
EXCEPTIONS OR NOTES RELATIVE TO  
TEST CONDITIONS LISTED IN TABLE 1  
AND APPENDIX B DATA LISTING

<u>RUN(S)</u>	
9 - 58	No data for Probe 8 due to sensor malfunction
10	Yaw angles are 9° and 35° instead of 0° and 30°
12	Not a 10 sec run
34	Probe 4 malfunction at yaw angle 50°
35 & 58	Probe 4 not available in "hi-speed" off-line data listing in appendix ("on-line" average data used in some report plots)
58	Yaw angle 44° used instead of 30°
61	No data at yaw angle 150°
65	Yaw angle 140° also used
72	No data at yaw angle 90°
94	This was a 35 kts run
99	Yaw angle - 150° also used
101	Run aborted - no "hi-speed" off-line data available
103 & 104	No "hi-speed" off-line data available
107	Yaw angle -150° also used
110	Yaw angle -40° used instead of -50°
112	This was a 35 kts run
133	No data at yaw angle -50°
135	"Hi-speed" data shows two sets of data for probe 1 and 2 - ignore first set.
142	Yaw angle +35° used instead of +30°
143 & 144	Yaw angles + 20° also used
148 - 167	Probe 10 malfunction; no data available
150	"Hi-speed" data tacked on to Run 149 data (see Appendix data listing)
153	No negative yaw angles used
160	No negative yaw angles used
161 - 163	"Hi-speed" data states + 15° roll - roll was actually 0°
168 - 208	Probe 6 malfunction; no data available
168 & 169	Yaw angle 155° used instead of 150° Yaw angle 217° also used ("hi-speed" off-line data states 220°)
170 & 171	Yaw angle 235° used instead of 240°
177	"Hi-speed" data tacked on to Run 176 data (see Appendix data listing)
186 & 187	Yaw angle 125° used instead of 120° Yaw angle 230° used instead of 240° (Run 186 - "hi-speed" data states 240°)
188 - 189	Yaw angle 155° used instead of 150°
190	Yaw angle 220° used instead of 240°

# Runs 1 - 8 Flow visualization (no computer data)

## BVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
9 10.2	0.0	1	0.00	0.00	0.00	0.1932E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		2	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		3	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		4	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		5	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		6	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		7	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		8	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		9	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		10	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
2 30.0		1	0.00	0.00	0.00	0.1277E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		2	0.00	0.00	0.00	0.1277E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		3	0.00	0.00	0.00	0.1277E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		4	0.00	0.00	0.00	0.1277E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		5	0.00	0.00	0.00	0.1277E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		6	0.00	0.00	0.00	0.1277E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		7	0.00	0.00	0.00	0.1277E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		8	0.00	0.00	0.00	0.1277E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		9	0.00	0.00	0.00	0.1277E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		10	0.00	0.00	0.00	0.1277E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
3 50.0		1	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		2	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		3	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		4	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		5	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		6	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		7	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		8	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		9	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E
		10	0.00	0.00	0.00	0.2292E	0.0000E	0.0000E	0.0000E	0.0000E	0.0000E



**OVVWT 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]

[illegible]

**BVMT 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]

## BVNT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]

# BVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
14 15.6	0.0	1	0.0	1	23.88	-6.00	6.22	0.8079	0.3108	0.5597	0.2117	0.2910	0.2126
				3	23.88	0.692	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				4	23.88	0.692	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				5	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				7	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				9	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				10	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
	2	30.0		1	23.88	-6.00	6.22	0.8079	0.3108	0.5597	0.2117	0.2910	0.2126
				2	23.88	0.692	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				3	23.88	0.692	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				4	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				5	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				7	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				9	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				10	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
	3	50.0		1	23.88	-6.00	6.22	0.8079	0.3108	0.5597	0.2117	0.2910	0.2126
				2	23.88	0.692	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				3	23.88	0.692	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				4	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				5	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				7	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				9	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				10	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
	4	90.0		1	23.88	-6.00	6.22	0.8079	0.3108	0.5597	0.2117	0.2910	0.2126
				2	23.88	0.692	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				3	23.88	0.692	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				4	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				5	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				7	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				9	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126
				10	23.88	20.60	6.22	0.6974	0.3494	0.5907	0.1670	0.2910	0.2126

SVMT 242/243 SHIP WAKE TURBULENCE TEST

2400 VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
15 23.0	0.0	1	0.0	1	23.00	-6.60	6.22	0.10039E 02	0.25855E 00	0.39450E 00	0.26455E 00	0.4190E 01	0.34239E 01
				3	23.00	0.600	6.222	0.011794E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				4	23.00	20.32	6.222	0.011794E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				5	23.00	40.64	6.222	0.011794E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				9	23.00	20.32	2.54	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				10	23.00	40.64	2.54	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				2	30.0	0.00	6.222	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				3	30.0	0.00	6.222	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				4	30.0	0.00	6.222	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				7	30.0	20.32	6.222	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				9	30.0	20.32	2.54	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				10	30.0	40.64	2.54	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				3	50.0	0.00	6.222	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				4	50.0	0.00	6.222	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				5	50.0	20.32	6.222	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				7	50.0	20.32	6.222	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				9	50.0	20.32	2.54	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				10	50.0	40.64	2.54	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				4	90.0	0.00	6.222	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				5	90.0	0.00	6.222	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				7	90.0	20.32	6.222	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				9	90.0	20.32	2.54	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				10	90.0	40.64	2.54	0.018531E 02	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00



**OVNT : 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]



**BVHT 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]

**QVWT 242/243**

RUN VEL	ROLL TP	YAW PROBE	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
19 10.5	0.0	2 0.0	1	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
19 10.5	0.0	2 0.0	2	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
19 10.5	0.0	2 0.0	3	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
19 10.5	0.0	2 0.0	4	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
19 10.5	0.0	2 0.0	5	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000
19 10.5	0.0	2 0.0	6	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000	0.00000000

## BVNT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]

RVWT-242/243 SHIP WAKE TURBULENCE TEST

[illegible]

[illegible]

**BVVT 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]

## BVWT 242/243

[illegible]

# SVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN	VX	MEAN	VY	MEAN	VZ	S.D.	VX	S.D.	VY	S.D.	VZ
25	22.4	0.0	1	0.0	1	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					2	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					3	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					4	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					5	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					6	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					7	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					8	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					9	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					10	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					11	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					12	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					13	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					14	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					15	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					16	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					17	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					18	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					19	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					20	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					21	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					22	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					23	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					24	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	
					25	170.00	0.00	6.00	0.13	0.00	0.19	0.00	0.13	0.00	0.17	0.00	0.25	0.00	0.19	



**BVNT 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]

**BVWT 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]

## BVNT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]

BYNT 242/243 SHIP WAKE TURBULENCE TEST

ROW	VFL	ROLL	TP	YAM	PROBE	X	Y	Z	MEAN	VX	VY	MEAN	VZ	S.D.	VX	S.D.	VY	S.D.	VZ
29	23.1	13.0	1	0.0	1	33	-6.00	6.22	0.08	0.2	0.01	0.00	0.0843	00	17.25	0.1905	0.1715	00	
						33	-6.40	6.22	1.21	0.2	0.01	0.00	0.1014	00	17.25	0.2635	0.1715	00	
						33	-6.80	6.22	2.41	0.2	0.01	0.00	0.1185	00	17.25	0.3365	0.1715	00	
						33	-7.20	6.22	3.61	0.2	0.01	0.00	0.1356	00	17.25	0.4095	0.1715	00	
						33	-7.60	6.22	4.81	0.2	0.01	0.00	0.1527	00	17.25	0.4825	0.1715	00	
						33	-8.00	6.22	6.01	0.2	0.01	0.00	0.1698	00	17.25	0.5555	0.1715	00	
						33	-8.40	6.22	7.21	0.2	0.01	0.00	0.1869	00	17.25	0.6285	0.1715	00	
						33	-8.80	6.22	8.41	0.2	0.01	0.00	0.2040	00	17.25	0.7015	0.1715	00	
						33	-9.20	6.22	9.61	0.2	0.01	0.00	0.2211	00	17.25	0.7745	0.1715	00	
						33	-9.60	6.22	10.81	0.2	0.01	0.00	0.2382	00	17.25	0.8475	0.1715	00	
						33	-6.00	6.22	0.08	0.2	0.01	0.00	0.1967	01	27.63	0.3548	0.1905	01	
						33	-6.40	6.22	1.21	0.2	0.01	0.00	0.1769	01	27.63	0.4278	0.1905	01	
						33	-6.80	6.22	2.41	0.2	0.01	0.00	0.1571	01	27.63	0.5008	0.1905	01	
						33	-7.20	6.22	3.61	0.2	0.01	0.00	0.1373	01	27.63	0.5738	0.1905	01	
						33	-7.60	6.22	4.81	0.2	0.01	0.00	0.1175	01	27.63	0.6468	0.1905	01	
						33	-8.00	6.22	6.01	0.2	0.01	0.00	0.0977	01	27.63	0.7198	0.1905	01	
						33	-8.40	6.22	7.21	0.2	0.01	0.00	0.0779	01	27.63	0.7928	0.1905	01	
						33	-8.80	6.22	8.41	0.2	0.01	0.00	0.0581	01	27.63	0.8658	0.1905	01	
						33	-9.20	6.22	9.61	0.2	0.01	0.00	0.0383	01	27.63	0.9388	0.1905	01	
						33	-9.60	6.22	10.81	0.2	0.01	0.00	0.0185	01	27.63	1.0118	0.1905	01	
						33	-6.00	6.22	0.08	0.2	0.01	0.00	0.1339	01	43.55	0.5209	0.2835	01	
						33	-6.40	6.22	1.21	0.2	0.01	0.00	0.1141	01	43.55	0.5939	0.2835	01	
						33	-6.80	6.22	2.41	0.2	0.01	0.00	0.0943	01	43.55	0.6669	0.2835	01	
						33	-7.20	6.22	3.61	0.2	0.01	0.00	0.0745	01	43.55	0.7399	0.2835	01	
						33	-7.60	6.22	4.81	0.2	0.01	0.00	0.0547	01	43.55	0.8129	0.2835	01	
						33	-8.00	6.22	6.01	0.2	0.01	0.00	0.0349	01	43.55	0.8859	0.2835	01	
						33	-8.40	6.22	7.21	0.2	0.01	0.00	0.0151	01	43.55	0.9589	0.2835	01	
						33	-8.80	6.22	8.41	0.2	0.01	0.00	0.0000	01	43.55	1.0319	0.2835	01	
						33	-9.20	6.22	9.61	0.2	0.01	0.00	0.0000	01	43.55	1.1049	0.2835	01	
						33	-9.60	6.22	10.81	0.2	0.01	0.00	0.0000	01	43.55	1.1779	0.2835	01	
						33	-6.00	6.22	0.08	0.2	0.01	0.00	0.2989	01	43.55	0.4607	0.4310	01	
						33	-6.40	6.22	1.21	0.2	0.01	0.00	0.3307	01	43.55	0.5337	0.4310	01	
						33	-6.80	6.22	2.41	0.2	0.01	0.00	0.3625	01	43.55	0.6067	0.4310	01	
						33	-7.20	6.22	3.61	0.2	0.01	0.00	0.3943	01	43.55	0.6797	0.4310	01	
						33	-7.60	6.22	4.81	0.2	0.01	0.00	0.4261	01	43.55	0.7527	0.4310	01	
						33	-8.00	6.22	6.01	0.2	0.01	0.00	0.4579	01	43.55	0.8257	0.4310	01	
						33	-8.40	6.22	7.21	0.2	0.01	0.00	0.4897	01	43.55	0.8987	0.4310	01	
						33	-8.80	6.22	8.41	0.2	0.01	0.00	0.5215	01	43.55	0.9717	0.4310	01	
						33	-9.20	6.22	9.61	0.2	0.01	0.00	0.5533	01	43.55	1.0447	0.4310	01	
						33	-9.60	6.22	10.81	0.2	0.01	0.00	0.5851	01	43.55	1.1177	0.4310	01	
						33	-6.00	6.22	0.08	0.2	0.01	0.00	0.3989	01	43.55	0.4260	0.5646	01	
						33	-6.40	6.22	1.21	0.2	0.01	0.00	0.4307	01	43.55	0.4990	0.5646	01	
						33	-6.80	6.22	2.41	0.2	0.01	0.00	0.4625	01	43.55	0.5720	0.5646	01	
						33	-7.20	6.22	3.61	0.2	0.01	0.00	0.4943	01	43.55	0.6450	0.5646	01	
						33	-7.60	6.22	4.81	0.2	0.01	0.00	0.5261	01	43.55	0.7180	0.5646	01	
						33	-8.00	6.22	6.01	0.2	0.01	0.00	0.5579	01	43.55	0.7910	0.5646	01	
						33	-8.40	6.22	7.21	0.2	0.01	0.00	0.5897	01	43.55	0.8640	0.5646	01	
						33	-8.80	6.22	8.41	0.2	0.01	0.00	0.6215	01	43.55	0.9370	0.5646	01	
						33	-9.20	6.22	9.61	0.2	0.01	0.00	0.6533	01	43.55	1.0100	0.5646	01	
						33	-9.60	6.22	10.81	0.2	0.01	0.00	0.6851	01	43.55	1.0830	0.5646	01	
						33	-6.00	6.22	0.08	0.2	0.01	0.00	0.2889	01	43.55	0.3877	0.7175	01	
						33	-6.40	6.22	1.21	0.2	0.01	0.00	0.3207	01	43.55	0.4607	0.7175	01	
						33	-6.80	6.22	2.41	0.2	0.01	0.00	0.3525	01	43.55	0.5337	0.7175	01	
						33	-7.20	6.22	3.61	0.2	0.01	0.00	0.3843	01	43.55	0.6067	0.7175	01	
						33	-7.60	6.22	4.81	0.2	0.01	0.00	0.4161	01	43.55	0.6797	0.7175	01	
						33	-8.00	6.22	6.01	0.2	0.01	0.00	0.4479	01	43.55	0.7527	0.7175	01	
						33	-8.40	6.22	7.21	0.2	0.01	0.00	0.4797	01	43.55	0.8257	0.7175	01	
						33	-8.80	6.22	8.41	0.2	0.01	0.00	0.5115	01	43.55	0.8987	0.7175	01	
						33	-9.20	6.22	9.61	0.2	0.01	0.00	0.5433	01	43.55	0.9717	0.7175	01	
						33	-9.60	6.22	10.81	0.2	0.01	0.00	0.5751	01	43.55	1.0447	0.7175	01	

0VMT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
30	10.3	12.0	2	0.0	1	43.16	-6.60	2.2	0.7533	0.5822	0.3509	0.1368	0.9844	0.6748
					3	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					4	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					5	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					6	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					7	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					8	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					9	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					10	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
3	30.0				1	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					2	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					3	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					4	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					5	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					6	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					7	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					8	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					9	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					10	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
4	50.0				1	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					2	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					3	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					4	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					5	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					6	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					7	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					8	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					9	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					10	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
5	90.0				1	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					2	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					3	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					4	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					5	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					6	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					7	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					8	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					9	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703
					10	43.16	-6.60	2.2	0.5711	0.4014	0.2590	0.1355	0.1468	0.1703

SVNT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
31.22.8	15.0	1	0.0	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			1	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			2	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			3	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			4	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			5	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			6	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			7	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			8	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			9	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			10	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			11	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			12	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			13	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			14	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			15	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			16	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			17	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			18	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			19	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			20	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			21	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			22	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			23	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			24	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			25	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			26	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			27	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			28	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			29	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000
			30	0.00	0.00	0.10717E	0.000000000	0.000000000	0.000000000	0.000000000	0.000000000

**BVNT 242/243 SHIP WAKE TURBULENCE TEST**

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OVNT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]



BBVT-242/243 SHIP WAKE TURBULENCE TEST

[illegible]

## OVHT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]

**6VNT 242/243 SHIP WAKE TURBULENCE TEST**[illegible]

## BVT 242/243 SHIP WAKE TURBULENCE TEST.

[illegible]

**BVWT 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]

**BVNT 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]

AVVT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]

8VNT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]



**BVVT 242/243 SHIP MAKE TURBULENCE TEST**

[illegible]

OVWT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]

**BVVT 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]

**BVWT 242/243 SHIP WAKE TURBULENCE TEST**

RUN VEL	ROLL TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
45.22.7	-15.0	1	10.69 10.69 10.69 10.69 10.69	60.00 60.00 60.00 60.00 60.00	66.66 66.66 66.66 66.66 66.66	8.77 8.77 8.77 8.77 8.77	1.00 1.00 1.00 1.00 1.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00
30.0	2	10.69 10.69 10.69 10.69 10.69	60.00 60.00 60.00 60.00 60.00	66.66 66.66 66.66 66.66 66.66	8.77 8.77 8.77 8.77 8.77	1.00 1.00 1.00 1.00 1.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00
50.0	3	10.69 10.69 10.69 10.69 10.69	60.00 60.00 60.00 60.00 60.00	66.66 66.66 66.66 66.66 66.66	8.77 8.77 8.77 8.77 8.77	1.00 1.00 1.00 1.00 1.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00
90.0	4	10.69 10.69 10.69 10.69 10.69	60.00 60.00 60.00 60.00 60.00	66.66 66.66 66.66 66.66 66.66	8.77 8.77 8.77 8.77 8.77	1.00 1.00 1.00 1.00 1.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00
120.0	5	10.69 10.69 10.69 10.69 10.69	60.00 60.00 60.00 60.00 60.00	66.66 66.66 66.66 66.66 66.66	8.77 8.77 8.77 8.77 8.77	1.00 1.00 1.00 1.00 1.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00
150.0	6	10.69 10.69 10.69 10.69 10.69	60.00 60.00 60.00 60.00 60.00	66.66 66.66 66.66 66.66 66.66	8.77 8.77 8.77 8.77 8.77	1.00 1.00 1.00 1.00 1.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00
180.0	7	10.69 10.69 10.69 10.69 10.69	60.00 60.00 60.00 60.00 60.00	66.66 66.66 66.66 66.66 66.66	8.77 8.77 8.77 8.77 8.77	1.00 1.00 1.00 1.00 1.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00

SVWT. 242/243 SHIP WAKE TURBULENCE TEST

[illegible]

**QVWT: 242/243**

[illegible]

OVWT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]

**BVMT 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]





**OVNT 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]

**OVHT 242/243**

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AVNT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]



SVMT 242/243 SHIP WAKE TURBULENCE TEST

PWM VEL	ROLL TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
56 18.2	0.0	1	0.0	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
		2	0.0	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
		3	0.0	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
		4	0.0	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
		5	0.0	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
		6	0.0	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
		7	0.0	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
		8	0.0	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
		9	0.0	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
		10	0.0	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
	2	30.0	1	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			2	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			3	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			4	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			5	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			6	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			7	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			8	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			9	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			10	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
	3	50.0	1	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			2	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			3	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			4	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			5	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			6	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			7	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			8	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			9	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			10	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
	4	90.0	1	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			2	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			3	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			4	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			5	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			6	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			7	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			8	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			9	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444
			10	0.00	0.03	0.1331	0.3392	0.5011	0.2287	0.8101	0.3444

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BOEING VERTOL CO PHILADELPHIA PA

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INVESTIGATION TO STUDY THE AERODYNAMIC SHIP WAKE TURBULENCE GEN--ETC(U)

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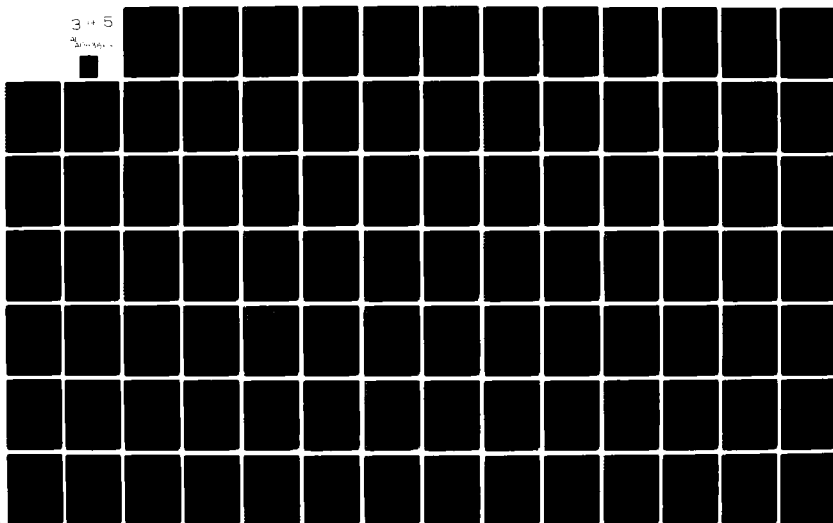
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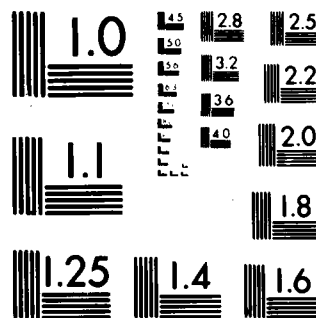
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SVWT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VEL	ROLL	TP	YAW	PROBE	X	Y	Z	NEAR	VX	NEAR	VY	MEAN	VZ	S.D.	VX	S.D.	VY	S.D.	VZ
59	10.1	0.0	1	0.0	1	0.0	10	10	10	10	10	10	10	10	10	10	10	10	10	10
2	30.0																			
3	50.0																			
4	90.0																			
5	120.0																			

[illegible]





SVNT 242/243 SHIP WAKE TURBULENCE TEST

1-9	RUN VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
62	17.9	0.0	7	150.0	9	170.49	20.32	12.45	0.10460E 03	-0.13235E 00	-0.34765E 01	0.10537E 01	0.36481E 01	0.12831E 01
90					10	170.49	40.64	12.45	0.10714E 03	0.24642E 01	-0.21422E 01	0.24026E 01	0.36443E 01	0.12831E 01



**BYVT 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]

BVNT 242/243 SHIP WAKE TURBULENCE TEST

20 RUN VEL	ROLL	TP	YAN PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ		
63	22.6	0.0	7	100.0	10	170.69	40.64	12.45	0.10677E 02	0.82465E-01	0.70245E 00	0.49665E 00	0.62300E 00	0.77499E 00



**BVNT 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]

SVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
65	10.0	-15.0	8	150.0	9	170.69	20.32	12.45	0.80895E 01	-0.14262E 00	-0.17930E 01	0.81375E 00	0.11206E 01	0.87888E 00
					10	170.69	40.64	12.45	0.86407E 01	0.70989E 00	-0.10030E 01	0.17192E 01	0.16799E 01	0.14056E 01
			9	180.0	1	170.69	-6.60	18.03	0.80892E 01	0.31405E 00	0.8010E 00	0.91810E 00	0.11533E 01	0.74506E 00
					2	170.69	0.60	18.03	0.86966E 01	-0.19449E 00	0.23558E 00	0.12108E 01	0.15549E 00	0.91988E 00
					3	170.69	6.60	18.03	0.86966E 01	0.36061E 00	0.44242E 00	0.13778E 01	0.15549E 00	0.92493E 00
					4	170.69	20.32	18.03	0.86966E 01	-0.37446E 00	0.50759E 00	0.13778E 01	0.15549E 00	0.92493E 00
					5	170.69	-6.60	18.03	0.86966E 01	-0.37446E 00	0.50759E 00	0.13778E 01	0.15549E 00	0.92493E 00
					6	170.69	6.60	18.03	0.86966E 01	-0.37446E 00	0.50759E 00	0.13778E 01	0.15549E 00	0.92493E 00
					7	170.69	-6.60	18.03	0.86966E 01	-0.37446E 00	0.50759E 00	0.13778E 01	0.15549E 00	0.92493E 00
					8	170.69	20.32	18.03	0.86966E 01	-0.37446E 00	0.50759E 00	0.13778E 01	0.15549E 00	0.92493E 00
					9	170.69	-6.60	18.03	0.86966E 01	-0.37446E 00	0.50759E 00	0.13778E 01	0.15549E 00	0.92493E 00
					10	170.69	20.32	18.03	0.86966E 01	-0.37446E 00	0.50759E 00	0.13778E 01	0.15549E 00	0.92493E 00



## BVT 242/243 SHIP WAKE TURBULENCE TEST

2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

[illegible]





OVNT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]

[illegible]

[illegible]



**BVWT 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]

RVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VR	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
74	22.8	-15.0	1	0.0	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
					50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

## BVT 242/243 SHIP WAKE TURBULENCE TEST

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RVNT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]

## BVWT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]

0001 242/243 SHIP WAKE TURBULENCE TEST

SUN VFL	ROLL TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
78 23.1	15.0	1	0.0	1	2	0.1713E	0.1730E	0.8301E	0.5418E	0.1624E	0.1616E
		2	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		3	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		4	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		5	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		6	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		7	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		8	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		9	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		10	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
	30.0	1	0.0	0.00	18.003	0.1713E	0.1730E	0.8301E	0.5418E	0.1624E	0.1616E
		2	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		3	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		4	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		5	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		6	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		7	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		8	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		9	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		10	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
	50.0	1	0.0	0.00	18.003	0.1713E	0.1730E	0.8301E	0.5418E	0.1624E	0.1616E
		2	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		3	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		4	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		5	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		6	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		7	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		8	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		9	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		10	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
	90.0	1	0.0	0.00	18.003	0.1713E	0.1730E	0.8301E	0.5418E	0.1624E	0.1616E
		2	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		3	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		4	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		5	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		6	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		7	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		8	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		9	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E
		10	0.0	0.00	18.003	0.1502E	0.1285E	0.3947E	0.1277E	0.2351E	0.2351E



# RVMT 242/243 SHIP WAKE TURBULENCE TEST

WIN VEL	ROLL TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
80 23.1	15.0	1	0.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
		2	0.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
		3	0.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
		4	0.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
		5	0.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
		6	0.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
		7	0.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
		8	0.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
		9	0.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
		10	0.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
			30.0	2	2	0.03	0.03	0.03	0.03	0.03	0.03
		3	50.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
		4	50.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
		5	50.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
		6	50.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
		7	50.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
		8	50.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
		9	50.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03
		10	50.0	1	1	0.03	0.03	0.03	0.03	0.03	0.03



BOVNT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]





SVNT 242/243 SHIP WAKE TURBULENCE TEST

TRUN VEL	ROLL	TP	VAV PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
83 10.3	15.0	9	180.0	9	170.69	20.32	12.45	0.90709E 01	-0.23994E 00	0.61481E 00	0.39460E 00	0.46402E 00
				10	170.69	40.64	12.45	0.94365E 01	0.85830E 01	0.32240E 00	0.48373E 00	0.59142E 00
												0.47075E 00



# RVNT 242/243 SHIP WAKE TURBULENCE TEST

23	RUN VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
23	84	22.6	15.0	7	180.0	9	170.69	20.32	12.45	0.18569E 02	-0.52681E 00	0.71573E 00	0.35681E 00	0.44428E 00
23	84	22.6	15.0	7	180.0	10	170.69	20.32	12.45	0.18569E 02	-0.52681E 00	0.71573E 00	0.35681E 00	0.44428E 00



BYWT 242/243 SHIP WAKE TURBULENCE TEST

228	RUN VEL	ROLL TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
85	10.8	0.0	8	100.0	9	170.69	-20.32	12.43	0.88398E 01	-0.37498E 00	0.57546E 00	0.32417E 00
10					10	170.69	-20.32	12.43	0.90506E 01	-0.37498E 00	0.57546E 00	0.32417E 00



[illegible]

SVMT 242/243 SHIP WAKE TURBULENCE TEST

N	W	VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
86	22.5	0.0	7	-180.0	9	170.69	-20.32	12.45	0.18572E 02	-0.30413E 00	0.89456E 00	0.41490E 00	0.54348E 00	0.54685E 00	0.54685E 00
10					10	170.69	-40.63	12.45	0.18861E 02	0.12070E 01	0.48776E 00	0.50613E 00	0.63801E 00	0.74583E 00	0.74583E 00







8VMT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
89 10.7	0.0	2	0.0	1	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				2	43.16	-0.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				3	43.16	-0.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				4	43.16	-0.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				5	43.16	-0.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				6	43.16	-0.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				7	43.16	-0.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				8	43.16	-0.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				9	43.16	-0.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				10	43.16	-0.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				3	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				4	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				5	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				6	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				7	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				8	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				9	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				10	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				3	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				4	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				5	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				6	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				7	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				8	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				9	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				10	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				3	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				4	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				5	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				6	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				7	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				8	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				9	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E
				10	43.16	-6.60	18.03	0.0161E	0.24570E	0.0	0.58725E	0.0	0.50186E

OVHT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
90	22.8	0.0	1	0.0	1	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					2	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					3	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					4	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					5	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					7	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					8	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					9	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					10	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
	-30.0	2			1	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					2	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					3	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					4	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					5	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					7	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					8	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					9	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					10	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
	-50.0	3			1	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					2	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					3	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					4	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					5	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					7	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					8	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					9	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					10	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
	-90.0	4			1	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					2	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					3	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					4	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					5	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					7	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					8	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					9	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E
					10	43.16	18.03	0.1492E	0.2267E	0.8433E	0.1489E	0.1937E	0.1330E



RVMT 242/243 SHIP WAKE TURBULENCE TEST

TIME VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
92 22.7	0.0	1	0.0	1	23.88	-6.60	18.03	0.17301E 02	-0.1376E 00	0.3586E 00	0.1510E 01	0.2142E 01	0.17271E 01
				2	23.88	0.00	18.03	0.14114E 02	-0.12716E 00	0.3586E 00	0.1510E 01	0.2142E 01	0.17271E 01
				3	23.88	0.00	18.03	0.12910E 02	-0.13550E 00	0.3586E 00	0.1510E 01	0.2142E 01	0.17271E 01
				4	23.88	-20.32	18.03	0.19641E 02	-0.13550E 00	0.3586E 00	0.1510E 01	0.2142E 01	0.17271E 01
				5	23.88	-40.64	18.03	0.19312E 02	-0.13550E 00	0.3586E 00	0.1510E 01	0.2142E 01	0.17271E 01
				7	23.88	-6.60	18.03	0.14780E 02	-0.13550E 00	0.3586E 00	0.1510E 01	0.2142E 01	0.17271E 01
				8	23.88	-6.60	12.45	0.14091E 02	-0.13550E 00	0.3586E 00	0.1510E 01	0.2142E 01	0.17271E 01
				9	23.88	-20.32	12.45	0.18796E 02	-0.13550E 00	0.3586E 00	0.1510E 01	0.2142E 01	0.17271E 01
				10	23.88	-40.64	12.45	0.19089E 02	-0.13550E 00	0.3586E 00	0.1510E 01	0.2142E 01	0.17271E 01
		2	-30.0	1	23.88	-6.60	18.03	0.14198E 02	0.35286E 01	0.21505E 01	0.36111E 01	0.43621E 01	0.33170E 01
				2	23.88	0.00	18.03	0.16136E 02	0.35286E 01	0.21505E 01	0.36111E 01	0.43621E 01	0.33170E 01
				3	23.88	0.00	18.03	0.17464E 02	0.35286E 01	0.21505E 01	0.36111E 01	0.43621E 01	0.33170E 01
				4	23.88	-20.32	18.03	0.15071E 02	0.35286E 01	0.21505E 01	0.36111E 01	0.43621E 01	0.33170E 01
				5	23.88	-40.64	18.03	0.19965E 02	0.35286E 01	0.21505E 01	0.36111E 01	0.43621E 01	0.33170E 01
				7	23.88	-6.60	12.45	0.16205E 02	0.35286E 01	0.21505E 01	0.36111E 01	0.43621E 01	0.33170E 01
				8	23.88	-6.60	12.45	0.12334E 02	0.35286E 01	0.21505E 01	0.36111E 01	0.43621E 01	0.33170E 01
				9	23.88	-20.32	12.45	0.16911E 02	0.35286E 01	0.21505E 01	0.36111E 01	0.43621E 01	0.33170E 01
				10	23.88	-40.64	12.45	0.17716E 02	0.35286E 01	0.21505E 01	0.36111E 01	0.43621E 01	0.33170E 01
		3	-50.0	1	23.88	-6.60	18.03	0.09219E 02	0.16288E 01	0.20472E 01	0.4197E 01	0.528E 01	0.6271E 01
				2	23.88	0.00	18.03	0.17277E 02	0.40209E 01	0.32302E 01	0.4333E 01	0.528E 01	0.6271E 01
				3	23.88	0.00	18.03	0.18016E 02	0.40209E 01	0.32302E 01	0.4333E 01	0.528E 01	0.6271E 01
				4	23.88	-20.32	18.03	0.15001E 02	0.40209E 01	0.32302E 01	0.4333E 01	0.528E 01	0.6271E 01
				5	23.88	-40.64	18.03	0.19233E 02	0.40209E 01	0.32302E 01	0.4333E 01	0.528E 01	0.6271E 01
				7	23.88	-6.60	12.45	0.19027E 02	0.40209E 01	0.32302E 01	0.4333E 01	0.528E 01	0.6271E 01
				8	23.88	-6.60	12.45	0.19718E 02	0.40209E 01	0.32302E 01	0.4333E 01	0.528E 01	0.6271E 01
				9	23.88	-20.32	12.45	0.17181E 02	0.40209E 01	0.32302E 01	0.4333E 01	0.528E 01	0.6271E 01
				10	23.88	-40.64	12.45	0.12312E 02	0.40209E 01	0.32302E 01	0.4333E 01	0.528E 01	0.6271E 01
		4	-90.0	1	23.88	-6.60	18.03	0.22173E 02	0.20171E 01	0.25569E 01	0.25912E 01	0.3032E 01	0.3594E 01
				2	23.88	0.00	18.03	0.24311E 02	0.20171E 01	0.25569E 01	0.25912E 01	0.3032E 01	0.3594E 01
				3	23.88	0.00	18.03	0.22651E 02	0.20171E 01	0.25569E 01	0.25912E 01	0.3032E 01	0.3594E 01
				4	23.88	-20.32	18.03	0.18737E 02	0.20171E 01	0.25569E 01	0.25912E 01	0.3032E 01	0.3594E 01
				5	23.88	-40.64	18.03	0.15535E 02	0.20171E 01	0.25569E 01	0.25912E 01	0.3032E 01	0.3594E 01
				7	23.88	-6.60	12.45	0.16207E 02	0.20171E 01	0.25569E 01	0.25912E 01	0.3032E 01	0.3594E 01
				8	23.88	-6.60	12.45	0.16230E 02	0.20171E 01	0.25569E 01	0.25912E 01	0.3032E 01	0.3594E 01
				9	23.88	-20.32	12.45	0.12558E 02	0.20171E 01	0.25569E 01	0.25912E 01	0.3032E 01	0.3594E 01
				10	23.88	-40.64	12.45	0.03329E 02	0.20171E 01	0.25569E 01	0.25912E 01	0.3032E 01	0.3594E 01



**BVNT 242/243 SHIP WAKE TURBULENCE TEST**

RUN	VFL	ROLL	TP	VAV	PROBE	X	Y	Z	MEAN	VX	MEAN	VY	MEAN	VZ	S.D.	VX	S.D.	VY	S.D.	VZ
94	18.0	0.0	1	0.0	1	0.00	-6.60	18.03	0.1160E	02	-0.2436E	00	0.7104E	00	0.1751E	01	0.1660E	01	0.2052E	01
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.03	0.1204E	02	-0.9158E	00	0.3908E	00	0.1384E	01	0.1567E	01	0.1971E	01
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.03	0.1225E	02	-0.1006E	00	0.3339E	00	0.1277E	01	0.1568E	01	0.1971E	01
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.03	0.1422E	02	-0.0065E	00	0.3202E	00	0.1398E	01	0.2023E	01	0.2255E	01
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.03	0.1422E	02	-0.0065E	00	0.3202E	00	0.1398E	01	0.2023E	01	0.2255E	01
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.03	0.1422E	02	-0.0065E	00	0.3202E	00	0.1398E	01	0.2023E	01	0.2255E	01
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.03	0.1422E	02	-0.0065E	00	0.3202E	00	0.1398E	01	0.2023E	01	0.2255E	01
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.03	0.1422E	02	-0.0065E	00	0.3202E	00	0.1398E	01	0.2023E	01	0.2255E	01
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.03	0.1422E	02	-0.0065E	00	0.3202E	00	0.1398E	01	0.2023E	01	0.2255E	01
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.03	0.1422E	02	-0.0065E	00	0.3202E	00	0.1398E	01	0.2023E	01	0.2255E	01
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.03	0.1422E	02	-0.0065E	00	0.3202E	00	0.1398E	01	0.2023E	01	0.2255E	01
2	36.0	2	1	2	3	0.00	-6.60	18.03	0.1526E	02	0.2983E	01	0.3235E	00	0.1233E	01	0.181E	01	0.1971E	01
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.03	0.1526E	02	0.2983E	01	0.3235E	00	0.1233E	01	0.181E	01	0.1971E	01
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.03	0.1498E	02	0.2119E	01	0.3081E	00	0.1515E	01	0.1962E	01	0.2255E	01
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.03	0.1498E	02	0.2119E	01	0.3081E	00	0.1515E	01	0.1962E	01	0.2255E	01
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.03	0.1621E	02	0.4731E	01	0.7768E	00	0.1747E	01	0.2214E	01	0.2561E	01
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.03	0.1621E	02	0.4731E	01	0.7768E	00	0.1747E	01	0.2214E	01	0.2561E	01
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.03	0.1621E	02	0.4731E	01	0.7768E	00	0.1747E	01	0.2214E			





[illegible]

**SVWT 242/243 SHIP WAKE TURBULENCE TEST**241

BVMT 242/243 SHIP MAKE TURBULENCE TEST

RUN	VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN	VX	MEAN	VY	MEAN	VZ	S.D.	VX	S.D.	VY	S.D.	VZ
98	10.4	15.0	2	0.0	1	170.69	-6.60	18.03	0.86100E	01	-0.61721E	01	0.69834E	00	0.49671E	00	0.58049E	00	0.67502E	00
					2	170.69	0.000	18.03	0.85686E	01	-0.55416E	00	0.43797E	00	0.74470E	00	0.67410E	00	0.73899E	00
					3	170.69	0.600	18.03	0.93196E	01	-0.34166E	00	0.21266E	00	0.69020E	00	0.60343E	00	0.70192E	00
					4	170.69	-20.64	18.03	0.96858E	01	-0.38033E	00	0.40575E	00	0.35485E	00	0.39688E	00	0.55889E	00
					5	170.69	-40.64	18.03	0.98513E	01	-0.60933E	00	0.56375E	00	0.22551E	00	0.29718E	00	0.52721E	00
					6	170.69	0.000	18.03	0.98513E	01	-0.53700E	00	0.40647E	00	0.57045E	00	0.67181E	00	0.60499E	00
					7	170.69	-6.60	18.03	0.98513E	01	-0.53700E	00	0.40647E	00	0.57045E	00	0.67181E	00	0.60499E	00
					8	170.69	-20.64	18.03	0.98513E	01	-0.53700E	00	0.40647E	00	0.57045E	00	0.67181E	00	0.60499E	00
					9	170.69	-40.64	18.03	0.98513E	01	-0.53700E	00	0.40647E	00	0.57045E	00	0.67181E	00	0.60499E	00
					10	170.69	-40.64	18.03	0.98513E	01	-0.53700E	00	0.40647E	00	0.57045E	00	0.67181E	00	0.60499E	00
					1	170.69	-6.60	18.03	0.73579E	01	0.62841E	00	0.45833E	00	0.10955E	01	0.12455E	01	0.86920E	00
					2	170.69	0.000	18.03	0.84866E	01	0.46618E	00	0.45833E	00	0.12631E	01	0.12455E	01	0.86920E	00
					3	170.69	0.600	18.03	0.85986E	01	0.11865E	01	0.23888E	01	0.90688E	00	0.84388E	00	0.99388E	01
					4	170.69	-20.64	18.03	0.89871E	01	-0.17405E	00	0.23888E	01	0.90688E	00	0.84388E	00	0.99388E	01
					5	170.69	-40.64	18.03	0.95690E	01	-0.98064E	00	0.14128E	01	0.10940E	01	0.17000E	01	0.22599E	01
					6	170.69	0.000	18.03	0.73527E	01	-0.59274E	00	0.14128E	01	0.10940E	01	0.17000E	01	0.22599E	01
					7	170.69	-6.60	18.03	0.80003E	01	-0.24719E	00	0.35188E	01	0.13958E	01	0.15890E	01	0.26126E	00
					8	170.69	-20.64	18.03	0.88662E	01	-0.91033E	00	0.10263E	01	0.43982E	00	0.4492E	00	0.66433E	00
					9	170.69	-40.64	18.03	0.88662E	01	-0.91033E	00	0.10263E	01	0.43982E	00	0.4492E	00	0.66433E	00
					10	170.69	-40.64	18.03	0.88662E	01	-0.91033E	00	0.10263E	01	0.43982E	00	0.4492E	00	0.66433E	00
					1	170.69	-6.60	18.03	0.63251E	01	0.67324E	00	0.45441E	00	0.17651E	01	0.16087E	01	0.14743E	01
					2	170.69	0.000	18.03	0.73080E	01	0.67324E	00	0.45441E	00	0.17651E	01	0.16087E	01	0.14743E	01
					3	170.69	0.600	18.03	0.74657E	01	0.10966E	01	0.28400E	01	0.19290E	00	0.14666E	01	0.15608E	01
					4	170.69	-20.64	18.03	0.77196E	01	-0.69601E	00	0.28400E	01	0.19290E	00	0.14666E	01	0.15608E	01
					5	170.69	-40.64	18.03	0.86315E	01	-0.15007E	00	0.28400E	01	0.19290E	00	0.14666E	01	0.15608E	01
					6	170.69	0.000	18.03	0.86315E	01	-0.15007E	00	0.28400E	01	0.19290E	00	0.14666E	01	0.15608E	01
					7	170.69	-6.60	18.03	0.86315E	01	-0.15007E	00	0.28400E	01	0.19290E	00	0.14666E	01	0.15608E	01
					8	170.69	-20.64	18.03	0.86315E	01	-0.15007E	00	0.28400E	01	0.19290E	00	0.14666E	01	0.15608E	01
					9	170.69	-40.64	18.03	0.86315E	01	-0.15007E	00	0.28400E	01	0.19290E	00	0.14666E	01	0.15608E	01
					10	170.69	-40.64	18.03	0.86315E	01	-0.15007E	00	0.28400E	01	0.19290E	00	0.14666E	01	0.15608E	01
					1	170.69	-6.60	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					2	170.69	0.000	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					3	170.69	0.600	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					4	170.69	-20.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					5	170.69	-40.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					6	170.69	0.000	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					7	170.69	-6.60	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					8	170.69	-20.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					9	170.69	-40.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					10	170.69	-40.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					1	170.69	-6.60	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					2	170.69	0.000	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					3	170.69	0.600	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					4	170.69	-20.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					5	170.69	-40.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					6	170.69	0.000	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					7	170.69	-6.60	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					8	170.69	-20.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					9	170.69	-40.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					10	170.69	-40.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					1	170.69	-6.60	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					2	170.69	0.000	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					3	170.69	0.600	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					4	170.69	-20.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					5	170.69	-40.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					6	170.69	0.000	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					7	170.69	-6.60	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					8	170.69	-20.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					9	170.69	-40.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					10	170.69	-40.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					1	170.69	-6.60	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					2	170.69	0.000	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					3	170.69	0.600	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					4	170.69	-20.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					5	170.69	-40.64	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					6	170.69	0.000	18.03	0.80280E	01	0.98649E	00	0.80433E	00	0.13392E	01	0.15677E	01	0.15459E	01
					7	170.69	-6.60	18.03	0.80280E	0										

GVMT 242/243 SHIP WAKE TURBULENCE TEST

2	3	ROLL	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
98	10.4	15.0	8	-100.0	9	170.69	13.43	0.91445E 01	-0.19496E 00	0.46734E 00	0.60292E 00	0.57144E 00	0.62202E 00
					10	170.69	13.43	0.91445E 01	-0.19496E 00	0.46734E 00	0.60292E 00	0.57144E 00	0.62202E 01

## BVWT 242/243 SHIP WAKE TURBULENCE TEST

SUM VEL	ROLL	TP	YAW	PITCH	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
99	10.1	15.0	2	0.0	1	33	18.03	0.89401E	0.0	0.74857E	0.50555E	0.54776E	0.44183E
					8	33	18.03	0.87914E	0.0	0.45110E	0.0	0.72723E	0.67199E
					8	33	18.03	0.58954E	0.0	0.22203E	0.0	0.72723E	0.77293E
					8	33	18.03	0.53180E	0.0	0.13306E	0.0	0.28718E	0.39717E
					8	33	12.45	0.89939E	0.0	0.19080E	0.0	0.28718E	0.77293E
					8	33	12.45	0.18398E	0.0	0.14266E	0.0	0.28718E	0.77293E
					8	33	12.45	0.40019E	0.0	0.32661E	0.0	0.28718E	0.77293E
					8	33	12.45	0.60969E	0.0	0.39395E	0.0	0.28718E	0.77293E
					8	33	12.45	0.14389E	0.0	0.0	0.0	0.0	0.0
					8	33	18.03	0.84174E	0.0	0.16648E	0.0	0.28718E	0.77293E
					8	33	18.03	0.55154E	0.0	0.26694E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10368E	0.0	0.35694E	0.0	0.28718E	0.77293E
					8	33	18.03	0.16758E	0.0	0.22970E	0.0	0.28718E	0.77293E
					8	33	18.03	0.59058E	0.0	0.94331E	0.0	0.28718E	0.77293E
					8	33	18.03	0.61770E	0.0	0.1046E	0.0	0.28718E	0.77293E
					8	33	18.03	0.0	0.0	0.0	0.0	0.0	0.0
					8	33	18.03	0.51265E	0.0	0.37266E	0.0	0.28718E	0.77293E
					8	33	18.03	0.09691E	0.0	0.10972E	0.0	0.28718E	0.77293E
					8	33	18.03	0.15106E	0.0	0.17358E	0.0	0.28718E	0.77293E
					8	33	18.03	0.77622E	0.0	0.35333E	0.0	0.28718E	0.77293E
					8	33	18.03	0.59114E	0.0	0.15713E	0.0	0.28718E	0.77293E
					8	33	18.03	0.66651E	0.0	0.94855E	0.0	0.28718E	0.77293E
					8	33	18.03	0.0	0.0	0.0	0.0	0.0	0.0
					8	33	18.03	0.10850E	0.0	0.17077E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10836E	0.0	0.14531E	0.0	0.28718E	0.77293E
					8	33	18.03	0.02224E	0.0	0.33203E	0.0	0.28718E	0.77293E
					8	33	18.03	0.88592E	0.0	0.25314E	0.0	0.28718E	0.77293E
					8	33	18.03	0.90635E	0.0	0.18677E	0.0	0.28718E	0.77293E
					8	33	18.03	0.0	0.0	0.0	0.0	0.0	0.0
					8	33	18.03	0.9953E	0.0	0.16000E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10845E	0.0	0.13000E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E
					8	33	18.03	0.10255E	0.0	0.17100E	0.0	0.28718E	0.77293E

## BVWT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]

# Run 101 Run aborted - no "hi-speed" off-line data available

BVMT 242/243 SHIP WAKE TURBULENCE TEST

BLM VOL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
102	9.7	15.0	6	0.0	1	23.88	18.03	-0.1262E+00	-0.3023E-01	-0.4295E-01	0.1860E+01	0.4790E-01	0.2589E-01
					2	23.88	18.03	-0.1209E+00	-0.6904E-01	-0.5327E-01	0.2527E-01	0.4150E-01	0.2597E-01
					3	23.88	18.03	-0.1054E+00	-0.5326E-01	-0.5674E-01	0.2769E+01	0.5165E-01	0.2671E-01
					4	23.88	18.03	-0.9775E-01	-0.1160E+00	-0.6703E-01	0.4334E+01	0.5108E-01	0.2665E-01
					7	23.88	12.45	-0.1508E+00	-0.6207E-01	-0.3030E-01	0.2241E+01	0.3130E-01	0.2862E-01
					8	23.88	12.45	-0.1364E+00	-0.3778E-01	-0.7318E-01	0.2452E+01	0.1870E-01	0.2095E-01
					9	23.88	12.45	-0.1365E+00	-0.7502E-01	-0.7339E-01	0.8009E+01	0.1403E-01	0.2042E-01
					10	23.88	12.45	-0.4388E-01	-0.5779E-01	-0.1064E+00	0.6284E+01	0.5982E-01	0.2479E-01
					7	23.88	18.03	-0.1274E+00	-0.5796E-01	-0.4696E-01	0.2125E+01	0.4329E-01	0.5016E-01
					8	23.88	18.03	-0.1278E+00	-0.5161E-01	-0.8797E-01	0.1747E+01	0.3082E-01	0.5842E-01
					9	23.88	18.03	-0.9338E-01	-0.5102E-01	-0.1703E-01	0.2268E+01	0.2352E-01	0.2905E-01
					10	23.88	18.03	-0.3632E-01	-0.4642E-01	-0.3016E-01	0.2398E+01	0.1153E-01	0.3950E-01
					7	23.88	12.45	-0.9080E-01	-0.4780E-01	-0.4930E-01	0.1398E+01	0.7007E-01	0.3833E-01
					8	23.88	12.45	-0.6708E-01	-0.4639E-01	-0.2428E-01	0.4144E+01	0.3097E-01	0.5011E-01
					9	23.88	12.45	-0.1290E+00	-0.8758E-01	-0.1190E-01	0.2194E+01	0.2018E-01	0.2768E-01
					10	23.88	12.45	-0.3179E-01	-0.6418E-01	-0.7649E-01	0.2384E+01	0.1542E-01	0.2050E-01
					8	23.88	18.03	-0.1197E+00	-0.3245E-01	-0.8337E-01	0.2950E+01	0.5636E-01	0.2677E-01
					9	23.88	18.03	-0.1330E+00	-0.1240E-01	-0.8221E-01	0.4391E+01	0.8494E-01	0.2990E-01
					10	23.88	18.03	-0.3994E-01	-0.3687E-01	-0.1343E-01	0.4438E+01	0.3165E-01	0.2996E-01
					7	23.88	12.45	-0.3498E-01	-0.7949E-01	-0.2276E-01	0.8748E+01	0.1120E-01	0.2424E-01
					8	23.88	12.45	-0.1246E+00	-0.4500E-01	-0.2030E-01	0.6381E+01	0.9478E-01	0.2856E-01
					9	23.88	12.45	-0.4307E-01	-0.2417E-01	-0.8020E-01	0.2530E+01	0.3276E-01	0.1648E-01
					10	23.88	12.45	-0.8616E-01	-0.1091E-01	-0.5280E-01	0.2881E+01	0.3803E-01	0.2008E-01
					7	23.88	18.03	-0.3889E-01	-0.4712E-01	-0.3969E-01	0.3337E+01	0.4713E-01	0.2912E-01
					8	23.88	18.03	-0.1339E+00	-0.6344E-01	-0.4136E-01	0.1163E+01	0.4724E-01	0.2758E-01
					9	23.88	18.03	-0.1394E+00	-0.1475E-01	-0.8520E-01	0.3119E+01	0.7043E-01	0.2565E-01
					10	23.88	18.03	-0.6103E-01	-0.1795E-01	-0.3456E-01	0.6819E+01	0.5599E-01	0.2402E-01
					7	23.88	12.45	-0.1934E+00	-0.1099E-01	-0.9147E-01	0.2951E+01	0.4399E-01	0.2872E-01
					8	23.88	12.45	-0.1916E+00	-0.1245E-01	-0.6227E-01	0.5822E+01	0.6400E-01	0.2154E-01
					9	23.88	12.45	-0.5438E-01	-0.1092E-01	-0.1592E-01	0.4791E+01	0.6620E-01	0.2346E-01
					10	23.88	12.45	-0.7462E-01	-0.6961E-01	-0.2331E-01	0.4791E+01	0.4470E-01	0.2058E-01

# Runs 103 & 104 No "hi-speed" off-line data available

## SWMT 242/243 SHIP WAKE TURBULENCE TEST

PUN VEL	ROLL TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
105 10.1	-15.0	2	0.0	-6.60	18.03	0.5701E 01	0.2962E 00	-0.3418E 00	0.10170E 01	0.10384E 01	0.98729E 00
		1	23.88	0.00	18.03	0.79394E 01	0.75060E 01	0.62327E 02	0.46497E 00	0.77552E 00	0.10001E 01
		3	23.88	6.60	18.03	0.82916E 01	0.35664E 00	0.40249E 00	0.15897E 00	0.73440E 00	0.76295E 00
		4	23.88	-20.32	18.03	0.94321E 01	0.51629E 00	0.69130E 00	0.57442E 00	0.73440E 00	0.46391E 00
		5	23.88	-40.64	18.03	0.19062E 01	0.56013E 01	0.83169E 00	0.10747E 01	0.678257E 00	0.87955E 00
		6	23.88	-6.60	12.45	0.52036E 01	0.63790E 01	0.60180E 00	0.10457E 00	0.678257E 00	0.66709E 00
		7	23.88	6.60	12.45	0.81243E 01	0.21633E 00	0.11375E 00	0.77114E 00	0.678257E 00	0.93199E 00
		8	23.88	-20.32	12.45	0.81243E 01	0.21633E 00	0.73398E 00	0.48491E 00	0.678257E 00	0.44419E 00
		9	23.88	-40.64	12.45	0.91321E 01	0.33184E 00	0.32331E 00	0.39952E 00	0.58415E 00	0.44819E 00
		10	23.88	0.00	18.03	0.54544E 01	0.83469E 00	0.14697E 01	0.19071E 01	0.19370E 01	0.17250E 01
	3 -30.0	1	23.88	-6.60	18.03	0.79075E 01	0.73471E 00	0.20544E 00	0.18730E 01	0.71026E 00	0.17835E 00
		2	23.88	6.60	18.03	0.90750E 01	0.34612E 00	0.20374E 00	0.64030E 00	0.71026E 00	0.18924E 00
		3	23.88	-20.32	18.03	0.82916E 01	0.70375E 00	0.20374E 00	0.12942E 01	0.71026E 00	0.17222E 00
		4	23.88	-40.64	18.03	0.22976E 01	0.10917E 00	0.20374E 00	0.12942E 01	0.71026E 00	0.17222E 00
		5	23.88	6.60	12.45	0.60180E 00	0.37915E 00	0.15325E 01	0.14479E 00	0.678257E 00	0.60180E 00
		6	23.88	-20.32	12.45	0.94321E 01	0.53717E 00	0.31123E 01	0.16840E 00	0.678257E 00	0.94321E 01
		7	23.88	-40.64	12.45	0.5804E 01	0.42171E 00	0.16188E 01	0.13126E 00	0.678257E 00	0.5804E 01
	4 -50.0	1	23.88	-6.60	18.03	0.5804E 01	0.77328E 00	0.1330E 01	0.27325E 01	0.4550E 01	0.26552E 01
		2	23.88	6.60	18.03	0.94321E 01	0.76552E 00	0.16188E 01	0.1330E 01	0.4550E 01	0.26552E 01
		3	23.88	-20.32	18.03	0.22976E 01	0.10917E 00	0.20374E 00	0.12942E 01	0.71026E 00	0.17222E 00
		4	23.88	-40.64	18.03	0.4441E 01	0.44068E 00	0.86784E 01	0.23390E 01	0.678257E 00	0.4441E 01
		5	23.88	6.60	12.45	0.22012E 01	0.42083E 00	0.19443E 00	0.12163E 01	0.20011E 01	0.17275E 01
		6	23.88	-20.32	12.45	0.10303E 01	0.91419E 00	0.29473E 00	0.11315E 01	0.20011E 01	0.17275E 01
		7	23.88	-40.64	12.45	0.11103E 01	0.37607E 00	0.7876E 01	0.16807E 01	0.20011E 01	0.17275E 01
		8	23.88	6.60	12.45	0.67825E 01	0.32097E 01	0.13390E 01	0.20423E 01	0.17275E 01	0.17275E 01
	5 -60.0	1	23.88	-6.60	18.03	0.65591E 01	0.15871E 01	0.47390E 00	0.22428E 01	0.22428E 01	0.23447E 01
		2	23.88	6.60	18.03	0.11213E 01	0.16222E 00	0.10322E 00	0.44763E 00	0.22428E 01	0.23447E 01
		3	23.88	-20.32	18.03	0.10303E 01	0.72511E 00	0.11022E 00	0.44763E 00	0.22428E 01	0.23447E 01
		4	23.88	-40.64	18.03	0.30263E 01	0.50291E 00	0.19476E 00	0.22428E 01	0.22428E 01	0.23447E 01
		5	23.88	6.60	12.45	0.11213E 01	0.16222E 00	0.10322E 00	0.44763E 00	0.22428E 01	0.23447E 01
		6	23.88	-20.32	12.45	0.10303E 01	0.72511E 00	0.11022E 00	0.44763E 00	0.22428E 01	0.23447E 01
		7	23.88	-40.64	12.45	0.30263E 01	0.50291E 00	0.19476E 00	0.22428E 01	0.22428E 01	0.23447E 01
		8	23.88	6.60	12.45	0.11213E 01	0.16222E 00	0.10322E 00	0.44763E 00	0.22428E 01	0.23447E 01
		9	23.88	-20.32	12.45	0.10303E 01	0.72511E 00	0.11022E 00	0.44763E 00	0.22428E 01	0.23447E 01
		10	23.88	-40.64	12.45	0.30263E 01	0.50291E 00	0.19476E 00	0.22428E 01	0.22428E 01	0.23447E 01



SVMT 242/243 SHIP WAKE TURBULENCE TEST

SW VEL	ROLL	TP	YAW PRONE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
106	10.2	-15.0	2	0.0	1	18.03	0.70072E 01	0.24131E 00	-0.27520E 00	0.85772E 00	0.86974E 00	0.77152E 00
					2	18.03	0.81601E 01	0.26602E 00	-0.47379E 00	0.98923E 00	0.69288E 00	0.81998E 00
					3	18.03	0.82555E 01	0.26127E 00	-0.11428E 00	0.95133E 00	0.74153E 00	0.81991E 00
					4	18.03	0.94806E 01	0.54876E 00	-0.11043E 00	0.48001E 00	0.63298E 00	0.48666E 00
					5	18.03	0.17918E 01	0.54876E 00	-0.11043E 00	0.75277E 00	0.62682E 00	0.61730E 00
					6	12.45	0.66488E 01	0.24093E 00	-0.64453E 00	0.80203E 00	0.92003E 00	0.75277E 00
					7	12.45	0.88810E 01	0.24093E 00	-0.64453E 00	0.80203E 00	0.68079E 00	0.75277E 00
					8	12.45	0.87180E 01	0.24093E 00	-0.64453E 00	0.80203E 00	0.68079E 00	0.75277E 00
					9	12.45	0.87180E 01	0.24093E 00	-0.64453E 00	0.80203E 00	0.68079E 00	0.75277E 00
					10	12.45	0.90898E 01	0.46209E 00	0.38838E 00	0.38608E 00	0.43242E 00	0.41932E 00
	3	-30.0			1	18.03	0.42895E 01	0.63537E 00	0.81844E 00	0.13640E 01	0.12212E 01	0.11930E 01
					2	18.03	0.72128E 01	0.20786E 00	-0.13655E 00	0.16018E 01	0.16813E 01	0.11930E 01
					3	18.03	0.89088E 01	0.20786E 00	-0.13655E 00	0.16018E 01	0.16813E 01	0.11930E 01
					4	18.03	0.80770E 01	0.92150E 00	-0.29070E 01	0.16384E 00	0.15371E 01	0.11930E 01
					5	18.03	0.23925E 01	0.63264E 00	0.70833E 00	0.93344E 00	0.13321E 00	0.77846E 00
					6	12.45	0.38262E 01	0.16670E 00	0.57836E 00	0.16062E 01	0.14841E 01	0.15233E 01
					7	12.45	0.86838E 01	0.16730E 00	0.26810E 01	0.13426E 01	0.20096E 01	0.17158E 01
					8	12.45	0.61058E 01	0.65616E 00	-0.80013E 00	0.20111E 00	0.14996E 01	0.13956E 01
					9	12.45	0.85751E 01	0.47216E 00	-0.18807E 01	0.68327E 00	0.10049E 01	0.92262E 00
	4	-50.0			1	18.03	0.40248E 01	0.16953E 00	0.16169E 01	0.29449E 01	0.21779E 01	0.24960E 01
					2	18.03	0.79229E 01	0.61376E 00	-0.85477E 00	0.24500E 01	0.19724E 01	0.22975E 01
					3	18.03	0.96906E 01	0.40399E 00	-0.10277E 01	0.02333E 01	0.13321E 01	0.21133E 01
					4	18.03	0.25658E 01	0.17038E 00	-0.62444E 00	0.12944E 01	0.13321E 01	0.21133E 01
					5	18.03	0.11555E 01	0.51784E 00	-0.69709E 01	0.10509E 01	0.23257E 01	0.24403E 01
					6	12.45	0.17822E 01	0.22666E 00	0.15931E 01	0.25193E 01	0.20654E 01	0.24403E 01
					7	12.45	0.91418E 01	0.11414E 00	0.22317E 01	0.23175E 01	0.18565E 01	0.24403E 01
					8	12.45	0.83138E 01	0.89855E 00	-0.10803E 01	0.02443E 01	0.17866E 01	0.24403E 01
					9	12.45	0.57338E 01	0.89258E 00	-0.14919E 01	0.02443E 01	0.17866E 01	0.24403E 01
	5	-90.0			1	18.03	0.33795E 01	0.89596E 00	-0.16373E 00	0.24666E 01	0.20629E 01	0.17866E 01
					2	18.03	0.81727E 01	0.17274E 00	-0.97133E 00	0.24666E 01	0.20629E 01	0.17866E 01
					3	18.03	0.10575E 01	0.17274E 00	-0.97133E 00	0.24666E 01	0.20629E 01	0.17866E 01
					4	18.03	0.29471E 01	0.34623E 00	0.34623E 00	0.15914E 01	0.17274E 01	0.24666E 01
					5	18.03	0.16259E 01	0.34623E 00	0.34623E 00	0.15914E 01	0.17274E 01	0.24666E 01
					6	12.45	0.91461E 01	0.43866E 00	-0.11748E 01	0.15914E 01	0.17274E 01	0.24666E 01
					7	12.45	0.91461E 01	0.43866E 00	-0.11748E 01	0.15914E 01	0.17274E 01	0.24666E 01
					8	12.45	0.91461E 01	0.43866E 00	-0.11748E 01	0.15914E 01	0.17274E 01	0.24666E 01
					9	12.45	0.91461E 01	0.43866E 00	-0.11748E 01	0.15914E 01	0.17274E 01	0.24666E 01
					10	12.45	0.15047E 01	0.24067E 00	0.92623E 01	0.12847E 00	0.14488E 01	0.14268E 01











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RUN VFL	ROLL TP	YAW PRIME	X	Y	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
111 10.3	0.0	2	0.0	0.00	0.3272E 01	0.51671E 00	0.18887E 00	0.14388E 01	0.12674E 01	0.13206E 01
		3	0.00	0.00	0.42225E 00	0.15539E 00	0.19872E 00	0.10782E 01	0.12590E 01	0.10111E 00
		4	0.00	0.00	0.2098E 00	0.22318E 00	0.11109E 00	0.10747E 01	0.13590E 01	0.10111E 00
		5	0.00	0.00	0.8148E 00	0.24681E 00	0.64609E 00	0.10898E 00	0.14037E 01	0.10111E 00
		6	0.00	0.00	0.32325E 01	0.54717E 00	0.22883E 00	0.8404E 01	0.11670E 01	0.10111E 00
		7	0.00	0.00	0.32325E 01	0.54717E 00	0.22883E 00	0.8404E 01	0.11670E 01	0.10111E 00
		8	0.00	0.00	0.32325E 01	0.54717E 00	0.22883E 00	0.8404E 01	0.11670E 01	0.10111E 00
		9	0.00	0.00	0.32325E 01	0.54717E 00	0.22883E 00	0.8404E 01	0.11670E 01	0.10111E 00
		10	0.00	0.00	0.77872E 01	0.3136E 01	0.36001E 00	0.13072E 00	0.11111E 00	0.10111E 00
					0.77872E 01	0.40245E 01	0.1272E 00	0.23971E 00	0.17956E 00	0.10111E 00
3 -30.0					0.12324E 01	0.10111E 00	0.1330E 01	0.1724E 01	0.1013E 01	0.1013E 01
		1	0.00	0.00	0.68152E 00	0.23576E 00	0.39915E 00	0.1470E 01	0.2147E 01	0.1013E 01
		2	0.00	0.00	0.77167E 00	0.23576E 00	0.1470E 01	0.1470E 01	0.2147E 01	0.1013E 01
		3	0.00	0.00	0.28028E 00	0.81180E 00	0.17153E 00	0.14528E 01	0.23083E 01	0.1013E 01
		4	0.00	0.00	0.55781E 00	0.23038E 00	0.18621E 00	0.1255E 01	0.23083E 01	0.1013E 01
		5	0.00	0.00	0.80189E 00	0.23038E 00	0.18621E 00	0.1255E 01	0.23083E 01	0.1013E 01
		6	0.00	0.00	0.91614E 00	0.23038E 00	0.18621E 00	0.1255E 01	0.23083E 01	0.1013E 01
		7	0.00	0.00	0.91614E 00	0.23038E 00	0.18621E 00	0.1255E 01	0.23083E 01	0.1013E 01
		8	0.00	0.00	0.91614E 00	0.23038E 00	0.18621E 00	0.1255E 01	0.23083E 01	0.1013E 01
		9	0.00	0.00	0.91614E 00	0.23038E 00	0.18621E 00	0.1255E 01	0.23083E 01	0.1013E 01
		10	0.00	0.00	0.39591E 01	0.13714E 01	0.26589E 01	0.31210E 00	0.30309E 01	0.1013E 01
4 -50.0					0.74293E 00	0.14030E 00	0.27831E 00	0.8088E 00	0.1035E 00	0.1035E 00
		1	0.00	0.00	0.74293E 00	0.14030E 00	0.27831E 00	0.8088E 00	0.1035E 00	0.1035E 00
		2	0.00	0.00	0.74293E 00	0.14030E 00	0.27831E 00	0.8088E 00	0.1035E 00	0.1035E 00
		3	0.00	0.00	0.74293E 00	0.14030E 00	0.27831E 00	0.8088E 00	0.1035E 00	0.1035E 00
		4	0.00	0.00	0.74293E 00	0.14030E 00	0.27831E 00	0.8088E 00	0.1035E 00	0.1035E 00
		5	0.00	0.00	0.74293E 00	0.14030E 00	0.27831E 00	0.8088E 00	0.1035E 00	0.1035E 00
		6	0.00	0.00	0.74293E 00	0.14030E 00	0.27831E 00	0.8088E 00	0.1035E 00	0.1035E 00
		7	0.00	0.00	0.74293E 00	0.14030E 00	0.27831E 00	0.8088E 00	0.1035E 00	0.1035E 00
		8	0.00	0.00	0.74293E 00	0.14030E 00	0.27831E 00	0.8088E 00	0.1035E 00	0.1035E 00
		9	0.00	0.00	0.74293E 00	0.14030E 00	0.27831E 00	0.8088E 00	0.1035E 00	0.1035E 00
		10	0.00	0.00	0.74293E 00	0.14030E 00	0.27831E 00	0.8088E 00	0.1035E 00	0.1035E 00









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Run Vel	Roll	TP	Yaw Probe	X	Y	Z	Mean VX	Mean VY	Mean VZ	S.D. VX	S.D. VY	S.D. VZ
115 10.7	0.0	2	0.0	1	-6.60	6.22	0.5034E	0.3621E	0.2429E	0.1384E	0.1186E	0.1153E
				2	0.00	6.22	0.3178E	-0.4294E	0.2429E	0.1405E	0.1008E	0.1269E
				3	0.00	6.22	0.4960E	0.1955E	0.2429E	0.1405E	0.1008E	0.1269E
				4	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				5	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				6	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				7	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				8	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				9	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				10	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
	3	-30.0		1	-6.60	6.22	0.5034E	0.3621E	0.2429E	0.1384E	0.1186E	0.1153E
				2	0.00	6.22	0.3178E	-0.4294E	0.2429E	0.1405E	0.1008E	0.1269E
				3	0.00	6.22	0.4960E	0.1955E	0.2429E	0.1405E	0.1008E	0.1269E
				4	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				5	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				6	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				7	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				8	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				9	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				10	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
	4	-50.0		1	-6.60	6.22	0.5034E	0.3621E	0.2429E	0.1384E	0.1186E	0.1153E
				2	0.00	6.22	0.3178E	-0.4294E	0.2429E	0.1405E	0.1008E	0.1269E
				3	0.00	6.22	0.4960E	0.1955E	0.2429E	0.1405E	0.1008E	0.1269E
				4	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				5	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				6	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				7	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				8	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				9	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				10	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
	5	-90.0		1	-6.60	6.22	0.5034E	0.3621E	0.2429E	0.1384E	0.1186E	0.1153E
				2	0.00	6.22	0.3178E	-0.4294E	0.2429E	0.1405E	0.1008E	0.1269E
				3	0.00	6.22	0.4960E	0.1955E	0.2429E	0.1405E	0.1008E	0.1269E
				4	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				5	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				6	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				7	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				8	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				9	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E
				10	-20.64	6.22	0.9136E	0.5711E	0.1794E	0.4270E	0.1084E	0.0624E



RVNT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
117 10.2	0.0	2	0.0	6.60	6.22	0.5686E 01	0.2330E 00	0.2489E 00	0.1519E 01	0.1512E 01	0.9982E 00
		1	43.16	0.00	6.22	0.5150E 01	0.1808E 00	0.2489E 00	0.1519E 01	0.1512E 01	0.9982E 00
		2	43.16	0.00	6.22	0.5242E 01	0.1803E 00	0.2489E 00	0.1519E 01	0.1512E 01	0.9982E 00
		3	43.16	0.00	6.22	0.5073E 01	0.1803E 00	0.2489E 00	0.1519E 01	0.1512E 01	0.9982E 00
		4	43.16	0.00	6.22	0.5382E 01	0.1803E 00	0.2489E 00	0.1519E 01	0.1512E 01	0.9982E 00
		5	43.16	0.00	6.22	0.5382E 01	0.1803E 00	0.2489E 00	0.1519E 01	0.1512E 01	0.9982E 00
		6	43.16	0.00	6.22	0.5382E 01	0.1803E 00	0.2489E 00	0.1519E 01	0.1512E 01	0.9982E 00
		7	43.16	0.00	6.22	0.5382E 01	0.1803E 00	0.2489E 00	0.1519E 01	0.1512E 01	0.9982E 00
		8	43.16	0.00	6.22	0.5382E 01	0.1803E 00	0.2489E 00	0.1519E 01	0.1512E 01	0.9982E 00
		9	43.16	0.00	6.22	0.5382E 01	0.1803E 00	0.2489E 00	0.1519E 01	0.1512E 01	0.9982E 00
		10	43.16	0.00	6.22	0.5382E 01	0.1803E 00	0.2489E 00	0.1519E 01	0.1512E 01	0.9982E 00
	3	-30.0	1	6.60	6.22	0.1657E 01	0.5649E 01	0.2009E 00	0.1672E 01	0.1275E 01	0.1264E 01
		2	43.16	0.00	6.22	0.2773E 01	0.5649E 01	0.2009E 00	0.1672E 01	0.1275E 01	0.1264E 01
		3	43.16	0.00	6.22	0.2773E 01	0.5649E 01	0.2009E 00	0.1672E 01	0.1275E 01	0.1264E 01
		4	43.16	0.00	6.22	0.2773E 01	0.5649E 01	0.2009E 00	0.1672E 01	0.1275E 01	0.1264E 01
		5	43.16	0.00	6.22	0.2773E 01	0.5649E 01	0.2009E 00	0.1672E 01	0.1275E 01	0.1264E 01
		6	43.16	0.00	6.22	0.2773E 01	0.5649E 01	0.2009E 00	0.1672E 01	0.1275E 01	0.1264E 01
		7	43.16	0.00	6.22	0.2773E 01	0.5649E 01	0.2009E 00	0.1672E 01	0.1275E 01	0.1264E 01
		8	43.16	0.00	6.22	0.2773E 01	0.5649E 01	0.2009E 00	0.1672E 01	0.1275E 01	0.1264E 01
		9	43.16	0.00	6.22	0.2773E 01	0.5649E 01	0.2009E 00	0.1672E 01	0.1275E 01	0.1264E 01
		10	43.16	0.00	6.22	0.2773E 01	0.5649E 01	0.2009E 00	0.1672E 01	0.1275E 01	0.1264E 01
	4	-50.0	1	6.60	6.22	0.1521E 01	0.5871E 01	0.1084E 00	0.1407E 01	0.1508E 01	0.1075E 01
		2	43.16	0.00	6.22	0.1521E 01	0.5871E 01	0.1084E 00	0.1407E 01	0.1508E 01	0.1075E 01
		3	43.16	0.00	6.22	0.1521E 01	0.5871E 01	0.1084E 00	0.1407E 01	0.1508E 01	0.1075E 01
		4	43.16	0.00	6.22	0.1521E 01	0.5871E 01	0.1084E 00	0.1407E 01	0.1508E 01	0.1075E 01
		5	43.16	0.00	6.22	0.1521E 01	0.5871E 01	0.1084E 00	0.1407E 01	0.1508E 01	0.1075E 01
		6	43.16	0.00	6.22	0.1521E 01	0.5871E 01	0.1084E 00	0.1407E 01	0.1508E 01	0.1075E 01
		7	43.16	0.00	6.22	0.1521E 01	0.5871E 01	0.1084E 00	0.1407E 01	0.1508E 01	0.1075E 01
		8	43.16	0.00	6.22	0.1521E 01	0.5871E 01	0.1084E 00	0.1407E 01	0.1508E 01	0.1075E 01
		9	43.16	0.00	6.22	0.1521E 01	0.5871E 01	0.1084E 00	0.1407E 01	0.1508E 01	0.1075E 01
		10	43.16	0.00	6.22	0.1521E 01	0.5871E 01	0.1084E 00	0.1407E 01	0.1508E 01	0.1075E 01
	5	-90.0	1	6.60	6.22	0.2827E 01	0.6197E 01	0.1071E 00	0.1622E 01	0.1557E 01	0.1691E 01
		2	43.16	0.00	6.22	0.2827E 01	0.6197E 01	0.1071E 00	0.1622E 01	0.1557E 01	0.1691E 01
		3	43.16	0.00	6.22	0.2827E 01	0.6197E 01	0.1071E 00	0.1622E 01	0.1557E 01	0.1691E 01
		4	43.16	0.00	6.22	0.2827E 01	0.6197E 01	0.1071E 00	0.1622E 01	0.1557E 01	0.1691E 01
		5	43.16	0.00	6.22	0.2827E 01	0.6197E 01	0.1071E 00	0.1622E 01	0.1557E 01	0.1691E 01
		6	43.16	0.00	6.22	0.2827E 01	0.6197E 01	0.1071E 00	0.1622E 01	0.1557E 01	0.1691E 01
		7	43.16	0.00	6.22	0.2827E 01	0.6197E 01	0.1071E 00	0.1622E 01	0.1557E 01	0.1691E 01
		8	43.16	0.00	6.22	0.2827E 01	0.6197E 01	0.1071E 00	0.1622E 01	0.1557E 01	0.1691E 01
		9	43.16	0.00	6.22	0.2827E 01	0.6197E 01	0.1071E 00	0.1622E 01	0.1557E 01	0.1691E 01
		10	43.16	0.00	6.22	0.2827E 01	0.6197E 01	0.1071E 00	0.1622E 01	0.1557E 01	0.1691E 01















BVMT 242/243 SHIP WAKE TURBULENCE TEST

0.00	VEL	NO. 1	YF	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
122	22.5	0.0	7	-100.0	8	170.69	-20.32	2.54	0.17924E 02	-0.99397E 00	0.28719E 00	0.48513E 00	0.53724E 00
					10	170.69	-40.64	2.54	0.16482E 02	0.83928E 00	0.21163E 00	0.51223E 00	0.53724E 00

BVMT 242/243 SHIP WAKE TURBULENCE TEST

ROW	VFL	ROLL	TP	YAW	PRDF	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
123	22.4	0.0	1	0.0		170.69	-6.60	6.22	0.13762E 02	0.52221E 01	0.14888E 01	0.17333E 01	0.20128E 01	0.16774E 01
						170.69	0.00	6.22	0.12460E 02	0.89229E 00	0.95821E 00	0.15089E 01	0.20136E 01	0.18030E 01
						170.69	-6.60	6.22	0.12013E 02	0.20523E 00	0.95541E 00	0.14891E 01	0.17170E 01	0.16608E 01
						170.69	-20.32	6.22	0.18752E 02	0.11625E 01	0.23672E 01	0.12955E 00	0.69184E 00	0.598850E 00
						170.69	-20.64	6.22	0.19164E 02	0.14529E 01	0.16376E 01	0.13033E 00	0.57474E 00	0.56259E 00
						170.69	-6.60	3.54	0.13422E 02	0.58211E 00	0.13355E 00	0.17533E 01	0.20070E 01	0.17677E 01
						170.69	-6.60	3.54	0.13422E 02	0.58211E 00	0.13355E 00	0.17533E 01	0.20070E 01	0.17677E 01
						170.69	-20.32	2.54	0.17032E 02	0.49035E 00	0.13598E 00	0.10223E 00	0.29936E 00	0.21897E 00
						170.69	-20.64	2.54	0.18420E 02	0.10140E 01	0.17426E 00	0.34414E 00	0.50348E 00	0.46997E 00
						170.69	-6.60	6.22	0.10779E 02	0.12311E 01	0.15171E 01	0.19882E 01	0.31862E 01	0.26932E 01
						170.69	0.00	6.22	0.11065E 02	0.20821E 01	0.23263E 01	0.25070E 01	0.38972E 01	0.33972E 01
						170.69	-6.60	6.22	0.11258E 02	0.14243E 01	0.13752E 01	0.25231E 01	0.30752E 01	0.33972E 01
						170.69	-20.32	6.22	0.19233E 02	0.23755E 00	0.42806E 00	0.54044E 00	0.18190E 00	0.21880E 00
						170.69	-6.60	2.54	0.11073E 02	0.40463E 01	0.31561E 01	0.19995E 01	0.28600E 01	0.52880E 01
						170.69	-6.60	3.54	0.10767E 02	0.39628E 01	0.67409E 01	0.23981E 01	0.31400E 01	0.31784E 01
						170.69	-20.32	3.54	0.16130E 02	0.35228E 01	0.57501E 00	0.41176E 00	0.18179E 00	0.21469E 00
						170.69	-20.64	3.54	0.16130E 02	0.35228E 01	0.57501E 00	0.41176E 00	0.18179E 00	0.21469E 00



BYNT 242/243 SHIP WAKE TURBULENCE TEST

PIN VFL	ROLL	TP	YAW PROBE	X	Y	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ	
124 10.4	15.0	8	-180.0	9	170.69	-20.32	2.54	0.82654E 01	-0.60447E 00	0.40048E 00	0.32387E 00	0.44897E 00
				10	170.69	-40.64	2.54	0.81212E 01	-0.77468E-01	0.16085E 00	0.30211E 00	0.34391E 00

BUWT 242/243 SHIP WAKE TURBULENCE TEST

RUN VFL	ROLL TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
125 10.2	15.0	2. 0.0	1 3 4 5 6 7 8 9 10	-0.60 -0.60 -0.32 -0.60 -0.32 -0.60 -0.60 -0.32 -0.60	6.00 6.00 6.00 6.00 6.00 6.00 6.00 6.00 6.00	2.22 2.22 2.22 2.22 2.22 2.22 2.22 2.22 2.22	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
		3 -30.0	1 2 3 4 5 6 7 8 9 10	-0.60 -0.60 -0.32 -0.60 -0.32 -0.60 -0.60 -0.32 -0.60	6.00 6.00 6.00 6.00 6.00 6.00 6.00 6.00 6.00	2.22 2.22 2.22 2.22 2.22 2.22 2.22 2.22 2.22	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
		4 -50.0	1 2 3 4 5 6 7 8 9 10	-0.60 -0.60 -0.32 -0.60 -0.32 -0.60 -0.60 -0.32 -0.60	6.00 6.00 6.00 6.00 6.00 6.00 6.00 6.00 6.00	2.22 2.22 2.22 2.22 2.22 2.22 2.22 2.22 2.22	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
		5 -90.0	1 2 3 4 5 6 7 8 9 10	-0.60 -0.60 -0.32 -0.60 -0.32 -0.60 -0.60 -0.32 -0.60	6.00 6.00 6.00 6.00 6.00 6.00 6.00 6.00 6.00	2.22 2.22 2.22 2.22 2.22 2.22 2.22 2.22 2.22	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
		6 -120.0	1 2 3 4 5 6 7 8 9 10	-0.60 -0.60 -0.32 -0.60 -0.32 -0.60 -0.60 -0.32 -0.60	6.00 6.00 6.00 6.00 6.00 6.00 6.00 6.00 6.00	2.22 2.22 2.22 2.22 2.22 2.22 2.22 2.22 2.22	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00





BVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
127 10.3	15.0	2	0.0	1	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				2	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				3	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				4	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				5	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				6	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				7	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				8	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				9	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				10	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				1	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				2	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				3	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				4	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				5	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				6	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				7	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				8	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				9	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				10	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				1	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				2	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				3	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				4	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				5	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				6	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				7	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				8	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				9	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00
				10	88	6.00	0.00	0.00	0.00	0.00	0.00	0.00

BMWT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL	TP	YAW PROBE	X	Y	7	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
120 10.4	15.0	2	0.0	0.00	-6.60	6.22	0.76023E 01	-0.45663E 00	0.71221E 00	0.64612E 00	0.72370E 00	0.69694E 00
				0.00	0.00	6.22	0.21223E 01	-0.83650E 00	0.15461E 00	0.18303E 01	0.16885E 01	0.18228E 01
				0.00	0.00	6.22	0.18784E 01	-0.33423E 00	-0.16739E 00	0.19887E 01	0.11343E 01	0.11261E 01
				0.00	-20.32	6.22	0.94509E 01	-0.89567E 00	-0.25412E 00	0.21269E 00	0.29433E 00	0.30103E 00
				0.00	-40.64	6.22	0.96891E 01	0.15093E 00	0.44308E 00	0.10664E 00	0.24077E 00	0.19125E 00
				0.00	-6.60	2.54	0.73174E 01	0.19598E 00	0.19012E 00	0.79939E 00	0.76380E 01	0.83186E 00
				0.00	-6.60	2.54	0.32070E 01	-0.32775E 00	0.19539E 00	0.10252E 01	0.10433E 01	0.96440E 00
				0.00	-20.32	2.54	0.88205E 01	-0.17226E 00	0.65588E 00	0.12080E 00	0.24338E 00	0.22377E 00
				0.00	-40.64	2.54	0.90456E 01	0.68961E 01	0.17938E 00	0.25397E 00	0.24956E 00	0.35633E 00
				0.00	-6.60	2.54	0.34771E 01	-0.34394E 01	0.17043E 01	0.20615E 01	0.18045E 01	0.18112E 01
				0.00	0.00	6.22	0.14719E 01	-0.44265E 01	0.30348E 01	0.16479E 01	0.19658E 01	0.20336E 01
				0.00	6.60	6.22	0.51110E 01	-0.13557E 00	0.17299E 01	0.28407E 01	0.25177E 01	0.20065E 01
				0.00	-20.32	6.22	0.24737E 01	-0.14903E 00	0.30996E 01	0.29444E 01	0.15404E 01	0.18976E 01
				0.00	-40.64	6.22	0.79371E 01	-0.10571E 00	0.27475E 01	0.11130E 01	0.15404E 01	0.20336E 01
				0.00	-6.60	2.54	0.30781E 01	-0.13638E 01	0.31636E 01	0.11184E 01	0.15533E 01	0.20336E 01
				0.00	-6.60	2.54	0.65801E 01	-0.25238E 00	0.19395E 01	0.27680E 01	0.25093E 01	0.20336E 01
				0.00	-20.32	2.54	0.10168E 01	-0.39719E 01	0.47395E 01	0.27680E 01	0.25093E 01	0.20336E 01
				0.00	-40.64	2.54	0.69699E 01	-0.14149E 01	0.32321E 01	0.18471E 01	0.13822E 01	0.21162E 01
				0.00	-6.60	6.22	0.53809E 00	-0.16138E 01	0.12896E 01	0.98888E 00	0.10651E 01	0.12135E 01
				0.00	0.00	6.22	0.22401E 01	-0.11513E 01	0.16261E 01	0.25367E 01	0.25367E 01	0.19249E 01
				0.00	6.60	6.22	0.90444E 01	-0.00033E 00	0.27507E 01	0.25076E 01	0.25367E 01	0.19249E 01
				0.00	-20.32	6.22	0.10569E 01	-0.18196E 01	0.33671E 01	0.18966E 01	0.17871E 01	0.16816E 01
				0.00	-40.64	6.22	0.16896E 01	-0.18164E 01	0.33671E 01	0.18966E 01	0.17871E 01	0.16816E 01
				0.00	-6.60	2.54	0.97362E 01	-0.12974E 01	0.19000E 01	0.23559E 01	0.22804E 01	0.10344E 01
				0.00	-6.60	2.54	0.53950E 01	-0.24100E 01	0.27208E 01	0.80155E 01	0.12804E 01	0.10344E 01
				0.00	-20.32	2.54	0.48216E 01	-0.19429E 01	0.17433E 01	0.17718E 01	0.13180E 01	0.13197E 01
				0.00	-40.64	2.54	0.48216E 01	-0.19429E 01	0.17433E 01	0.17718E 01	0.13180E 01	0.13197E 01



# RVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VEL	ROLL	TP	YAW	PRUE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
129	10.2	-15.0	8	-180.0	9	170.69	-20.32	2.54	0.89943E 01	-0.65375E 00	0.47832E 00	0.19682E 00	0.24332E 00	0.24457E 00
					10	170.69	-20.32	2.54	0.92803E 01	-0.10265E 00	0.32522E 00	0.28931E 00	0.34320E 00	0.41489E 00









BVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
133	10.2	-15.0	2	0.0	1	0.00	6.22	0.77159E 00	0.9513E 01	-0.86907E 00	0.325E 01	0.9133E 00	0.10601E 01
					2	0.00	6.333	0.7831E 01	0.40937E 00	-0.29851E 00	0.1365E 01	0.9241E 00	0.1520E 00
					3	0.00	6.333	0.7501E 01	0.2774E 00	-0.3504E 00	0.1667E 01	0.9115E 00	0.1520E 00
					4	0.00	6.333	0.9823E 01	0.5704E 00	-0.6448E 00	0.2145E 01	0.9015E 00	0.1520E 00
					5	0.00	6.333	0.0113E 01	0.3044E 00	-0.6799E 00	0.1445E 01	0.9051E 00	0.1520E 00
					6	0.00	6.333	0.6116E 01	0.3044E 00	-0.6799E 00	0.1445E 01	0.9051E 00	0.1520E 00
					7	0.00	6.333	0.7192E 01	0.3044E 00	-0.6799E 00	0.1445E 01	0.9051E 00	0.1520E 00
					8	0.00	6.333	0.7223E 01	0.3044E 00	-0.6799E 00	0.1445E 01	0.9051E 00	0.1520E 00
					9	0.00	6.333	0.7223E 01	0.3044E 00	-0.6799E 00	0.1445E 01	0.9051E 00	0.1520E 00
					10	0.00	6.333	0.9464E 01	0.3044E 00	-0.6799E 00	0.1445E 01	0.9051E 00	0.1520E 00
						0.00	6.22	0.1546E 01	0.1672E 01	-0.8223E 00	0.3231E 01	0.1559E 01	0.1718E 01
					1	0.00	6.22	0.1000E 01	0.1206E 01	-0.2244E 00	0.1023E 01	0.1559E 01	0.1718E 01
					2	0.00	6.22	0.9024E 01	0.1206E 01	-0.2244E 00	0.1023E 01	0.1559E 01	0.1718E 01
					3	0.00	6.22	0.4555E 01	0.1206E 01	-0.2244E 00	0.1023E 01	0.1559E 01	0.1718E 01
					4	0.00	6.22	0.6123E 01	0.1206E 01	-0.2244E 00	0.1023E 01	0.1559E 01	0.1718E 01
					5	0.00	6.22	0.1437E 01	0.1206E 01	-0.2244E 00	0.1023E 01	0.1559E 01	0.1718E 01
					6	0.00	6.22	0.9306E 01	0.1206E 01	-0.2244E 00	0.1023E 01	0.1559E 01	0.1718E 01
					7	0.00	6.22	0.3495E 01	0.1206E 01	-0.2244E 00	0.1023E 01	0.1559E 01	0.1718E 01
					8	0.00	6.22	0.3495E 01	0.1206E 01	-0.2244E 00	0.1023E 01	0.1559E 01	0.1718E 01
					9	0.00	6.22	0.3495E 01	0.1206E 01	-0.2244E 00	0.1023E 01	0.1559E 01	0.1718E 01
					10	0.00	6.22	0.3495E 01	0.1206E 01	-0.2244E 00	0.1023E 01	0.1559E 01	0.1718E 01

SVNT 242/243 SHIP WAKE TURBULENCE TEST

ROW VEL	ROLL TP	YAW PRGME	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
134 10.3	0.0 3	0.0	1 2 3 4 5 6 7 8 9 10	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	
	4	10.0	1 2 3 4 5 6 7 8 9 10	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	
	6	-10.0	1 2 3 4 5 6 7 8 9 10	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00	

RVMT 242/243 SHIP WAKE TURBULENCE TEST

GUN VEL	ROLL TP	YAW PRONE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
135 22.6	0.0 1	0.0	1	6.60	6.34	0.45379E 01	0.22282E 02	0.105E 01	0.1793E 01	0.30083E 01	0.2384E 01
			2	6.60	6.34	0.92917E 01	0.32228E 02	0.117E 01	0.3168E 01	0.20083E 01	0.16404E 01
			3	6.60	6.34	0.43013E 01	0.15287E 01	0.0E 00	0.1793E 01	0.20083E 01	0.16404E 01
			4	6.60	6.34	0.30573E 01	0.67224E 02	0.0E 00	0.1657E 01	0.20209E 01	0.15919E 01
			5	20.32	6.34	0.19147E 01	0.30256E 01	0.0E 00	0.0781E 01	0.1176E 01	0.09724E 01
			6	6.60	6.34	0.20437E 01	0.1771E 01	0.0E 00	0.1485E 01	0.12909E 01	0.12679E 01
			7	6.60	6.34	0.63135E 01	0.23882E 01	0.0E 00	0.06004E 01	0.33310E 01	0.24566E 01
			8	6.60	6.34	0.64429E 01	0.23882E 01	0.0E 00	0.06004E 01	0.33310E 01	0.24566E 01
			9	20.32	6.34	0.1824E 01	0.4711E 01	0.0E 00	0.10454E 01	0.80132E 01	0.89065E 01
			10	20.32	6.34	0.19168E 01	0.70873E 01	0.0E 00	0.18388E 01	0.96622E 01	0.97210E 01
	2 10.0		1	6.60	6.34	0.16068E 01	0.1859E 01	0.0E 00	0.17067E 01	0.29662E 01	0.18664E 01
			2	6.60	6.34	0.38999E 01	0.18131E 01	0.0E 00	0.30353E 01	0.19502E 01	0.13631E 01
			3	6.60	6.34	0.40207E 01	0.55493E 01	0.0E 00	0.13964E 01	0.17701E 01	0.18861E 01
			4	6.60	6.34	0.19555E 01	0.11276E 01	0.0E 00	0.37684E 01	0.47011E 01	0.54341E 01
			5	6.60	6.34	0.11011E 01	0.10936E 01	0.0E 00	0.21016E 01	0.26022E 01	0.30553E 01
			6	6.60	6.34	0.16125E 01	0.50938E 01	0.0E 00	0.20215E 01	0.28073E 01	0.32404E 01
			7	6.60	6.34	0.53420E 01	0.10938E 01	0.0E 00	0.10135E 01	0.12703E 01	0.14603E 01
			8	6.60	6.34	0.18331E 01	0.48932E 01	0.0E 00	0.10141E 01	0.42602E 01	0.42337E 01
			9	20.32	6.34	0.90106E 01	0.99175E 01	0.0E 00	0.20183E 01	0.3282E 01	0.26673E 01
	4 10.0		1	6.60	6.34	0.1577E 01	0.67673E 01	0.0E 00	0.17105E 01	0.15052E 01	0.14049E 01
			2	6.60	6.34	0.20934E 01	0.12558E 01	0.0E 00	0.50943E 01	0.13122E 01	0.14864E 01
			3	6.60	6.34	0.13733E 01	0.22507E 01	0.0E 00	0.32843E 01	0.0E 00	0.22280E 01
			4	6.60	6.34	0.72544E 01	0.42071E 01	0.0E 00	0.17692E 01	0.28554E 01	0.22280E 01
			5	6.60	6.34	0.23046E 01	0.15545E 01	0.0E 00	0.32183E 01	0.0E 00	0.42679E 01
			6	6.60	6.34	0.10932E 01	0.44833E 01	0.0E 00	0.10403E 01	0.17225E 01	0.17225E 01
			7	6.60	6.34	0.10932E 01	0.44833E 01	0.0E 00	0.10403E 01	0.17225E 01	0.17225E 01
			8	6.60	6.34	0.10932E 01	0.44833E 01	0.0E 00	0.10403E 01	0.17225E 01	0.17225E 01
			9	6.60	6.34	0.10932E 01	0.44833E 01	0.0E 00	0.10403E 01	0.17225E 01	0.17225E 01
			10	20.32	6.34	0.10932E 01	0.44833E 01	0.0E 00	0.10403E 01	0.17225E 01	0.17225E 01





BMWT 242/243 SHIP WAKE TURBULENCE TEST

NUM VEL	ROLL TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
137 10.3	0.0 10	-20.0	9	0.00	-20.32	2.54	0.3371E 01	0.49045E 00	0.17506E 00	0.10708E 01	0.96973E 00
			10	0.00	20.32	2.54	0.82861E 01	-0.65514E -01	0.36945E 00	0.49822E 00	0.45870E 00
	11	-30.0	1	0.00	-6.60	6.34	0.1409E 01	0.3378E 01	0.13901E 00	0.056E 00	0.18281E 01
			2	0.00	0.00	6.34	0.12821E 01	0.10117E 00	0.02208E 00	0.15611E 00	0.12892E 00
			3	0.00	0.00	6.34	0.86949E 01	0.41019E 00	0.05205E 00	0.07111E 00	0.25816E 00
			4	0.00	-20.32	6.34	0.34746E 01	0.86086E 00	0.24226E 00	0.15867E 00	0.19188E 00
			5	0.00	20.32	2.54	0.96740E 01	0.23208E 00	0.20505E 00	0.12027E 00	0.150983E 00
			6	0.00	-6.60	6.34	0.38219E 01	0.39265E 00	0.23877E 00	0.18412E 00	0.170003E 00
			7	0.00	6.60	2.54	0.94019E 01	0.71120E 00	0.26400E 00	0.04036E 00	0.047003E 00
			8	0.00	-20.32	2.54	0.17074E 01	0.91082E -02	0.25071E 00	0.04036E 00	0.15406E 00
			9	0.00	20.32	2.54	0.90599E 01	-0.91082E -02	0.16553E 00	0.11999E 00	0.47772E 00
			10	0.00	0.00	6.34	0.12379E 01	0.15029E 01	0.96190E 00	0.1091E 00	0.11256E 01
	12	-50.0	1	0.00	-6.60	6.34	0.88577E 01	0.20888E 00	0.22434E 00	0.19650E 00	0.20370E 00
			2	0.00	0.00	6.34	0.92900E 01	0.20888E 00	0.05483E 00	0.19650E 00	0.47347E 00
			3	0.00	0.00	6.34	0.31071E 01	0.8898E 00	0.05483E 00	0.19650E 00	0.10560E 00
			4	0.00	-20.32	6.34	0.98800E 01	0.10131E 00	0.05483E 00	0.19650E 00	0.10560E 00
			5	0.00	20.32	2.54	0.18035E 01	0.19947E 00	0.05483E 00	0.19650E 00	0.10560E 00
			6	0.00	-6.60	6.34	0.18035E 01	0.19947E 00	0.05483E 00	0.19650E 00	0.10560E 00
			7	0.00	6.60	2.54	0.55655E 01	0.19947E 00	0.05483E 00	0.19650E 00	0.10560E 00
			8	0.00	-20.32	2.54	0.55655E 01	0.19947E 00	0.05483E 00	0.19650E 00	0.10560E 00
			9	0.00	20.32	2.54	0.55655E 01	0.19947E 00	0.05483E 00	0.19650E 00	0.10560E 00
			10	0.00	0.00	6.34	0.55655E 01	0.19947E 00	0.05483E 00	0.19650E 00	0.10560E 00



8VMT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL	TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
138 22.5	0.0	8	-20.0	9	0.00	-20.32	0.61272E 01	-0.72532E 00	0.70392E 00	0.19750E 01	0.21228E 01	0.21461E 01
				10	0.00	-20.32	0.18838E 02	-0.72539E 00	0.22157E 01	0.48504E 00	0.61766E 00	0.66671E 00
		9	-30.0	1	0.00	-6.60	0.23869E 01	0.63199E 01	0.7735E 01	0.30775E 01	0.24271E 01	0.22220E 01
				2	0.00	0.00	0.00718E 02	0.0028041E 00	0.22821E 00	0.42631E 00	0.50464E 00	0.36060E 00
				3	0.00	0.00	0.18971E 02	0.0021472E 00	0.48977E 00	0.86438E 00	0.13173E 00	0.90619E 00
				4	0.00	-20.32	0.12016E 02	0.0018031E 00	0.49622E 00	0.43782E 00	0.00437E 00	0.38342E 00
				5	0.00	-20.32	0.20346E 02	0.0083125E 00	0.36220E 00	0.33633E 00	0.00437E 00	0.47156E 00
				7	0.00	-6.60	0.17345E 02	0.0086732E 00	0.46147E 00	0.23449E 00	0.00437E 00	0.27330E 00
				8	0.00	-6.60	0.21155E 02	0.0022687E 00	0.33514E 00	0.97655E 00	0.00437E 00	0.11027E 00
				10	0.00	-20.32	0.19144E 02	0.0022687E 00	0.33514E 00	0.49622E 00	0.00437E 00	0.11027E 00
		10	-50.0	1	0.00	-6.60	0.29728E 01	0.23856E 01	0.10157E 00	0.23374E 01	0.23374E 01	0.27836E 01
				2	0.00	0.00	0.27337E 02	0.0023491E 00	0.53177E 00	0.42631E 00	0.23374E 01	0.27836E 01
				3	0.00	0.00	0.19981E 02	0.0023491E 00	0.53177E 00	0.42631E 00	0.23374E 01	0.27836E 01
				4	0.00	-20.32	0.14885E 02	0.0023491E 00	0.53177E 00	0.42631E 00	0.23374E 01	0.27836E 01
				5	0.00	-20.32	0.21097E 02	0.0023491E 00	0.53177E 00	0.42631E 00	0.23374E 01	0.27836E 01
				7	0.00	-20.32	0.22630E 02	0.0023491E 00	0.53177E 00	0.42631E 00	0.23374E 01	0.27836E 01
				8	0.00	-6.60	0.21807E 02	0.0023491E 00	0.53177E 00	0.42631E 00	0.23374E 01	0.27836E 01
				9	0.00	-20.32	0.23161E 02	0.0023491E 00	0.53177E 00	0.42631E 00	0.23374E 01	0.27836E 01
				10	0.00	-20.32	0.19821E 02	0.0023491E 00	0.53177E 00	0.42631E 00	0.23374E 01	0.27836E 01





AD-A083 663

BOEING VERTOL CO PHILADELPHIA PA

F/G 20/4

INVESTIGATION TO STUDY THE AERODYNAMIC SHIP WAKE TURBULENCE GEN--ETC(U)

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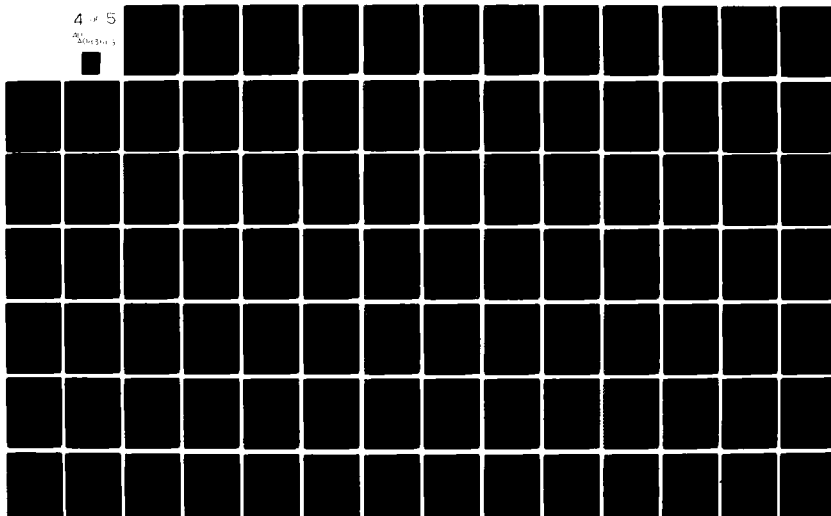
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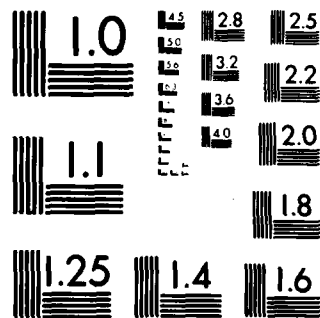
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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS 1963 A

SVNT 242/243 SHIP WAKE TURBULENCE TEST

ROW	VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
139	10.3	0.0	9	-20.0	9	4.59	-20.32	2.54	0.29749E 01	-0.78631E 00	0.78535E -01	0.94981E 00	0.99919E 00	0.10230E 01
			10	-20.0	10	4.59	-20.32	2.54	0.91163E 01	-0.43946E 00	0.10299E -01	0.52913E 00	0.52511E 00	0.47003E 00
			10	-30.0	1	4.59	-6.60	6.34	0.24329E 01	-0.33351E 00	0.27423E 00	0.16001E 00	0.05711E 00	0.16500E 01
					2	4.59	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
					3	4.59	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
					4	4.59	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
					5	4.59	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
					6	4.59	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
					7	4.59	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
					8	4.59	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
					9	4.59	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
					10	4.59	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
					11	4.59	-6.60	6.34	0.95315E 00	-0.90001E 00	0.17698E 00	0.10311E 00	0.37891E 00	0.12571E 00
						2	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
						3	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
						4	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
						5	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
						6	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
						7	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
						8	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
						9	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00
						10	-6.60	6.34	0.00906E 00	-0.16333E 00	0.20126E 00	0.00919E 00	0.00571E 00	0.00000E 00



SVNT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL	TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ									
140 22.6	0.0	8	-20.0	9	4.59	20.32	2.54	0.58389E	01	-0.46092E	00	-0.58339E	01	0.18330E	01	0.67374E	01	0.17371E	01	0.67330E	01
				10	4.59	20.32	2.54	0.18925E	02	-0.62135E	00	0.21982E	01	0.18330E	01	0.66614E	01	0.17371E	01	0.67330E	01
			9 -30.0	1	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				2	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				3	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				4	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				5	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				6	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				7	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				8	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				9	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				10	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
			10 -50.0	1	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				2	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				3	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				4	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				5	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				6	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				7	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				8	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				9	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00
				10	4.59	20.32	2.54	0.58389E	01	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00	0.00000E	00



SVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VFL	ROLL	1P	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
141	10.1	0.0	9	-20.0	9	9.18	2.54	0.30749E 01	-0.54029E 00	-0.12474E 01	0.7161E 00	0.97504E 00	0.11281E 01
			10		10	9.18	2.54	0.30814E 01	0.15153E 00	0.10603E 01	0.3713E 00	0.35667E 00	0.44534E 00
			10	-30.0	1	9.18	2.54	0.30749E 01	0.54029E 00	0.12474E 01	0.7161E 00	0.97504E 00	0.11281E 01
			2		2	9.18	2.54	0.30814E 01	0.15153E 00	0.10603E 01	0.3713E 00	0.35667E 00	0.44534E 00
			3		3	9.18	2.54	0.30749E 01	0.54029E 00	0.12474E 01	0.7161E 00	0.97504E 00	0.11281E 01
			4		4	9.18	2.54	0.30814E 01	0.15153E 00	0.10603E 01	0.3713E 00	0.35667E 00	0.44534E 00
			5		5	9.18	2.54	0.30749E 01	0.54029E 00	0.12474E 01	0.7161E 00	0.97504E 00	0.11281E 01
			6		6	9.18	2.54	0.30814E 01	0.15153E 00	0.10603E 01	0.3713E 00	0.35667E 00	0.44534E 00
			7		7	9.18	2.54	0.30749E 01	0.54029E 00	0.12474E 01	0.7161E 00	0.97504E 00	0.11281E 01
			8		8	9.18	2.54	0.30814E 01	0.15153E 00	0.10603E 01	0.3713E 00	0.35667E 00	0.44534E 00
			9		9	9.18	2.54	0.30749E 01	0.54029E 00	0.12474E 01	0.7161E 00	0.97504E 00	0.11281E 01
			10		10	9.18	2.54	0.30814E 01	0.15153E 00	0.10603E 01	0.3713E 00	0.35667E 00	0.44534E 00
			11	-50.0	1	9.18	2.54	0.30749E 01	0.54029E 00	0.12474E 01	0.7161E 00	0.97504E 00	0.11281E 01
			2		2	9.18	2.54	0.30814E 01	0.15153E 00	0.10603E 01	0.3713E 00	0.35667E 00	0.44534E 00
			3		3	9.18	2.54	0.30749E 01	0.54029E 00	0.12474E 01	0.7161E 00	0.97504E 00	0.11281E 01
			4		4	9.18	2.54	0.30814E 01	0.15153E 00	0.10603E 01	0.3713E 00	0.35667E 00	0.44534E 00
			5		5	9.18	2.54	0.30749E 01	0.54029E 00	0.12474E 01	0.7161E 00	0.97504E 00	0.11281E 01
			6		6	9.18	2.54	0.30814E 01	0.15153E 00	0.10603E 01	0.3713E 00	0.35667E 00	0.44534E 00
			7		7	9.18	2.54	0.30749E 01	0.54029E 00	0.12474E 01	0.7161E 00	0.97504E 00	0.11281E 01
			8		8	9.18	2.54	0.30814E 01	0.15153E 00	0.10603E 01	0.3713E 00	0.35667E 00	0.44534E 00
			9		9	9.18	2.54	0.30749E 01	0.54029E 00	0.12474E 01	0.7161E 00	0.97504E 00	0.11281E 01
			10		10	9.18	2.54	0.30814E 01	0.15153E 00	0.10603E 01	0.3713E 00	0.35667E 00	0.44534E 00









SVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL	TP	YAN PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
143 10.3	0.0	7	90.0	10	23.88	20.32	2.54	0.9435E 01	0.1594E 00	0.6104E 00	0.9907E 00	0.8636E 00
		9	-10.0	10	23.88	20.32	2.54	0.9435E 01	0.1594E 00	0.6104E 00	0.9907E 00	0.8636E 00
		10	-20.0	10	23.88	20.32	2.54	0.9435E 01	0.1594E 00	0.6104E 00	0.9907E 00	0.8636E 00
		11	-30.0	10	23.88	20.32	2.54	0.9435E 01	0.1594E 00	0.6104E 00	0.9907E 00	0.8636E 00
		12	-50.0	10	23.88	20.32	2.54	0.9435E 01	0.1594E 00	0.6104E 00	0.9907E 00	0.8636E 00
		13	-70.0	10	23.88	20.32	2.54	0.9435E 01	0.1594E 00	0.6104E 00	0.9907E 00	0.8636E 00
		14	-90.0	10	23.88	20.32	2.54	0.9435E 01	0.1594E 00	0.6104E 00	0.9907E 00	0.8636E 00







BNWT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL	TP	YAW	PRBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
145 10.3	15.0	9	-20.0	10	9.18	-20.32	2.54	0.3378E 01	-0.97226E 00	-0.85421E 00	0.11381E 01	0.12404E 01	0.12013E 01
		10	-30.0	1	9.18	-6.60	6.34	0.89631E 01	-0.36073E 00	0.16345E 01	0.43336E 00	0.32174E 00	0.44226E 00
		2		2	9.18	0.00	6.34	0.41588E 00	-0.13010E 00	0.20907E 01	0.19555E 00	0.16011E 00	0.16619E 00
		3		3	9.18	0.00	6.34	0.28217E 00	-0.17517E 00	0.14295E 00	0.19223E 00	0.16011E 00	0.16619E 00
		4		4	9.18	-20.32	6.34	0.36969E 00	-0.17517E 00	0.14295E 00	0.19223E 00	0.16011E 00	0.16619E 00
		5		5	9.18	-20.32	6.34	0.36969E 00	-0.17517E 00	0.14295E 00	0.19223E 00	0.16011E 00	0.16619E 00
		6		6	9.18	-20.32	6.34	0.36969E 00	-0.17517E 00	0.14295E 00	0.19223E 00	0.16011E 00	0.16619E 00
		7		7	9.18	-20.32	6.34	0.36969E 00	-0.17517E 00	0.14295E 00	0.19223E 00	0.16011E 00	0.16619E 00
		8		8	9.18	-20.32	6.34	0.36969E 00	-0.17517E 00	0.14295E 00	0.19223E 00	0.16011E 00	0.16619E 00
		9		9	9.18	-20.32	6.34	0.36969E 00	-0.17517E 00	0.14295E 00	0.19223E 00	0.16011E 00	0.16619E 00
		10		10	9.18	-20.32	6.34	0.36969E 00	-0.17517E 00	0.14295E 00	0.19223E 00	0.16011E 00	0.16619E 00
		11	-50.0	1	9.18	-6.60	6.34	0.71955E 00	-0.80135E 00	0.20126E 01	0.10449E 00	0.13217E 00	0.13652E 01
		2		2	9.18	0.00	6.34	0.26644E 00	-0.59592E 00	0.17069E 00	0.12233E 00	0.13217E 00	0.13652E 01
		3		3	9.18	0.00	6.34	0.89527E 00	-0.79568E 00	0.17069E 00	0.12233E 00	0.13217E 00	0.13652E 01
		4		4	9.18	-20.32	6.34	0.29955E 00	-0.80135E 00	0.17069E 00	0.12233E 00	0.13217E 00	0.13652E 01
		5		5	9.18	-20.32	6.34	0.10293E 00	-0.80135E 00	0.17069E 00	0.12233E 00	0.13217E 00	0.13652E 01
		6		6	9.18	-20.32	6.34	0.86824E 00	-0.17319E 00	0.23664E 00	0.12233E 00	0.13217E 00	0.13652E 01
		7		7	9.18	-20.32	6.34	0.93244E 00	-0.17319E 00	0.23664E 00	0.12233E 00	0.13217E 00	0.13652E 01
		8		8	9.18	-20.32	6.34	0.93244E 00	-0.17319E 00	0.23664E 00	0.12233E 00	0.13217E 00	0.13652E 01
		9		9	9.18	-20.32	6.34	0.93244E 00	-0.17319E 00	0.23664E 00	0.12233E 00	0.13217E 00	0.13652E 01
		10		10	9.18	-20.32	6.34	0.93244E 00	-0.17319E 00	0.23664E 00	0.12233E 00	0.13217E 00	0.13652E 01





SVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN VFL	ROLL YP	YAW PRBUE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
146 23.0	15.0	8	-20.0	9	9.18	0.85823E 01	0.15269E 01	-0.23243E 01	0.15259E 01	0.24911E 01	0.26499E 01
		10	-20.0	9.18	9.18	0.18817E 02	0.12235E 01	0.24657E 01	0.17767E 00	0.13849E 00	0.10964E 00
	9	-30.0	1	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			2	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			3	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			4	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			5	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			6	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			7	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			8	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			9	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			10	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
	10	-50.0	1	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			2	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			3	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			4	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			5	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			6	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			7	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			8	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			9	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01
			10	8	9.18	0.77446E 01	0.27027E 01	0.40969E 01	0.36111E 00	0.24857E 00	0.09499E 01







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BVMT 242/243 SHIP WAKE TURBULENCE TEST

PUR VEL	ROLL TP	YAW PRGME	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
148 22.8	15.0	0	4.59	-20.32	2.54	0.67470E 01	-0.82502E 00	-0.13428E 01	0.19005E 01	0.25762E 01	0.25502E 01
			4.59	20.32	2.54	0.18826E 02	-0.94829E 00	0.24199E 01	0.48787E 01	0.61150E 00	0.26797E 00
	9	-30.0	4.59	-6.60	6.34	0.83920E 01	-0.39389E 01	0.51488E 01	0.31422E 01	0.35108E 01	0.36375E 01
			4.59	0.00	6.34	0.55207E 01	-0.31798E 01	0.25831E 01	0.40816E 01	0.34381E 01	0.43304E 01
			4.59	6.60	6.34	0.68488E 01	-0.25442E 01	0.37623E 01	0.44219E 01	0.36922E 01	0.41254E 01
			4.59	-20.32	2.54	0.69188E 01	-0.45491E 01	0.42116E 01	0.41895E 01	0.32706E 01	0.46878E 01
			4.59	20.32	2.54	0.71700E 01	-0.58235E 01	0.41164E 01	0.31928E 01	0.29998E 01	0.38169E 01
			4.59	-6.60	6.34	0.82234E 01	-0.10386E 01	0.56456E 01	0.31666E 01	0.23779E 01	0.37630E 01
			4.59	0.00	6.34	0.72231E 01	-0.25338E 00	0.89575E 01	0.48016E 01	0.29998E 01	0.55511E 01
			4.59	6.60	2.54	0.19351E 02	-0.92338E 00	0.74780E 01	0.43924E 01	0.23779E 01	0.28483E 01
			4.59	-20.32	2.54	0.53909E 01	-0.18383E 01	0.36820E 01	0.23451E 01	0.22528E 01	0.46151E 01
			4.59	0.00	6.34	0.29444E 01	-0.20455E 01	0.47323E 01	0.42488E 01	0.30622E 01	0.49849E 01
			4.59	6.60	6.34	0.19747E 01	-0.28897E 01	0.47323E 01	0.42488E 01	0.30622E 01	0.49849E 01
			4.59	-20.32	2.54	0.87425E 01	-0.56679E 01	0.19831E 01	0.32257E 01	0.25201E 01	0.46542E 01
			4.59	20.32	2.54	0.21641E 01	-0.39579E 01	0.49831E 01	0.32257E 01	0.25201E 01	0.46542E 01
			4.59	-6.60	6.34	0.20123E 01	-0.37569E 01	0.46258E 01	0.32084E 01	0.25201E 01	0.46542E 01
			4.59	0.00	6.34	0.39234E 01	-0.25092E 01	0.37569E 01	0.32084E 01	0.25201E 01	0.46542E 01
			4.59	6.60	2.54	0.20444E 01	-0.10011E 01	0.39551E 01	0.32084E 01	0.25201E 01	0.46542E 01
			4.59	-20.32	2.54	0.20444E 01	-0.10011E 01	0.39551E 01	0.32084E 01	0.25201E 01	0.46542E 01







BVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL TP	YAW PRDF	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
150 22.8	15.0 15	50.0	5	0.00	20.32	6.34	0.3549E-00	0.4236E-00	0.3462E-01	0.2265E-01	0.3240E-01
			7	0.00	6.60	6.34	0.3521E-01	0.6266E-01	0.3322E-01	0.2280E-01	0.3240E-01
			8	0.00	6.60	2.54	0.1633E-01	0.1488E-01	0.7331E-01	0.3667E-01	0.3240E-01
			9	0.00	20.32	2.54	0.2712E-04	0.4888E-01	0.3310E-01	0.5233E-05	0.3240E-01
			10	0.00	20.32	2.54	0.2943E-04	0.3436E-09	0.3175E-05	0.2783E-05	0.3240E-01
	17 -10.0		1	0.00	6.60	6.34	0.7337E-00	0.5694E-00	0.1529E-01	0.2180E-01	0.3240E-01
			2	0.00	6.60	6.34	0.2338E-01	0.1493E-01	0.3509E-01	0.3933E-01	0.3240E-01
			3	0.00	6.60	6.34	0.6416E-00	0.5094E-00	0.3509E-01	0.3933E-01	0.3240E-01
			4	0.00	20.32	6.34	0.4979E-01	0.2905E-00	0.1983E-01	0.3149E-01	0.3240E-01
			5	0.00	20.32	6.34	0.3940E-01	0.3405E-00	0.2832E-01	0.3149E-01	0.3240E-01
			6	0.00	6.60	2.54	0.2970E-01	0.1774E-01	0.1983E-01	0.3149E-01	0.3240E-01
			7	0.00	6.60	2.54	0.2970E-01	0.1774E-01	0.1983E-01	0.3149E-01	0.3240E-01
			8	0.00	20.32	2.54	0.2945E-04	0.8371E-09	0.3220E-05	0.3029E-05	0.3240E-01
			9	0.00	20.32	2.54	0.2945E-04	0.8371E-09	0.3220E-05	0.3029E-05	0.3240E-01
			10	0.00	20.32	2.54	0.2945E-04	0.8371E-09	0.3220E-05	0.3029E-05	0.3240E-01
	18 -20.0		1	0.00	6.60	6.34	0.3818E-01	0.2063E-01	0.2773E-01	0.2607E-01	0.3240E-01
			2	0.00	6.60	6.34	0.5116E-01	0.2870E-01	0.3843E-01	0.3170E-01	0.3240E-01
			3	0.00	6.60	6.34	0.1415E-00	0.0891E-01	0.3301E-01	0.2709E-01	0.3240E-01
			4	0.00	20.32	6.34	0.7369E-00	0.3870E-01	0.3301E-01	0.2709E-01	0.3240E-01
			5	0.00	20.32	6.34	0.7369E-00	0.3870E-01	0.3301E-01	0.2709E-01	0.3240E-01
			6	0.00	6.60	2.54	0.7369E-00	0.3870E-01	0.3301E-01	0.2709E-01	0.3240E-01
			7	0.00	6.60	2.54	0.7369E-00	0.3870E-01	0.3301E-01	0.2709E-01	0.3240E-01
			8	0.00	6.60	2.54	0.7369E-00	0.3870E-01	0.3301E-01	0.2709E-01	0.3240E-01
			9	0.00	20.32	2.54	0.2899E-04	0.1343E-01	0.2941E-05	0.2712E-05	0.3240E-01
			10	0.00	20.32	2.54	0.2899E-04	0.1343E-01	0.2941E-05	0.2712E-05	0.3240E-01
	19 -30.0		1	0.00	6.60	6.34	0.4400E-01	0.4311E-01	0.4311E-01	0.3588E-01	0.3240E-01
			2	0.00	6.60	6.34	0.8679E-01	0.4311E-01	0.4311E-01	0.3588E-01	0.3240E-01
			3	0.00	6.60	6.34	0.9228E-01	0.1744E-01	0.4311E-01	0.3588E-01	0.3240E-01
			4	0.00	20.32	6.34	0.4171E-01	0.1640E-01	0.4311E-01	0.3588E-01	0.3240E-01
			5	0.00	20.32	6.34	0.4171E-01	0.1640E-01	0.4311E-01	0.3588E-01	0.3240E-01
			6	0.00	6.60	2.54	0.4171E-01	0.1640E-01	0.4311E-01	0.3588E-01	0.3240E-01
			7	0.00	6.60	2.54	0.4171E-01	0.1640E-01	0.4311E-01	0.3588E-01	0.3240E-01
			8	0.00	6.60	2.54	0.4171E-01	0.1640E-01	0.4311E-01	0.3588E-01	0.3240E-01
			9	0.00	20.32	2.54	0.2385E-04	0.3551E-01	0.4311E-01	0.3588E-01	0.3240E-01
			10	0.00	20.32	2.54	0.2385E-04	0.3551E-01	0.4311E-01	0.3588E-01	0.3240E-01
	20 -50.0		1	0.00	6.60	6.34	0.2047E-01	0.4682E-08	0.3042E-05	0.2242E-05	0.3240E-01
			2	0.00	6.60	6.34	0.2047E-01	0.4682E-08	0.3042E-05	0.2242E-05	0.3240E-01
			3	0.00	6.60	6.34	0.2047E-01	0.4682E-08	0.3042E-05	0.2242E-05	0.3240E-01
			4	0.00	20.32	6.34	0.2047E-01	0.4682E-08	0.3042E-05	0.2242E-05	0.3240E-01
			5	0.00	20.32	6.34	0.2047E-01	0.4682E-08	0.3042E-05	0.2242E-05	0.3240E-01
			6	0.00	6.60	2.54	0.2047E-01	0.4682E-08	0.3042E-05	0.2242E-05	0.3240E-01
			7	0.00	6.60	2.54	0.2047E-01	0.4682E-08	0.3042E-05	0.2242E-05	0.3240E-01
			8	0.00	6.60	2.54	0.2047E-01	0.4682E-08	0.3042E-05	0.2242E-05	0.3240E-01
			9	0.00	20.32	2.54	0.2047E-01	0.4682E-08	0.3042E-05	0.2242E-05	0.3240E-01
			10	0.00	20.32	2.54	0.2047E-01	0.4682E-08	0.3042E-05	0.2242E-05	0.3240E-01



BVMT 742/243 SHIP WAKE TURBULENCE TEST

WAVE VEL	ROLL	TP	YAW PRONE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
151 10.5	15.0	10	-20.0	9	0.00	-20.32	4.57	0.37283E 01	-0.25605E 00	0.12733E 01	0.13423E 01	0.12914E 01
		10		10	0.00	-20.32	4.57	0.86244E 01	0.60996E 01	0.89103E 00	0.63023E 00	0.21762E 01
11 -30.0												
		1		1	0.00	-6.60	12.45	0.35371E 01	0.77444E 01	0.18069E 01	0.09408E 01	0.19671E 01
		2		2	0.00	0.00	12.45	0.36471E 01	0.42222E 00	0.22911E 01	0.26118E 01	0.22471E 01
		3		3	0.00	0.00	12.45	0.86054E 01	0.60819E 00	0.13211E 01	0.11192E 01	0.17931E 01
		4		4	0.00	0.00	12.45	0.71235E 01	0.65747E 00	0.13509E 01	0.00000E 00	0.17931E 01
		5		5	0.00	0.00	12.45	0.95698E 01	0.26971E 00	0.00000E 00	0.00000E 00	0.17931E 01
		6		6	0.00	0.00	12.45	0.33927E 01	0.40441E 00	0.00000E 00	0.00000E 00	0.17931E 01
		7		7	0.00	0.00	12.45	0.33233E 01	0.40888E 00	0.00000E 00	0.00000E 00	0.17931E 01
		8		8	0.00	0.00	12.45	0.33583E 01	0.40888E 00	0.00000E 00	0.00000E 00	0.17931E 01
		9		9	0.00	0.00	12.45	0.33583E 01	0.40888E 00	0.00000E 00	0.00000E 00	0.17931E 01
		10		10	0.00	-20.32	4.57	0.86994E 01	0.11343E 01	0.83358E 00	0.35623E 00	0.20331E 01
12 -30.0												
		1		1	0.00	-8.60	12.45	0.11476E 01	0.22069E 00	0.17165E 01	0.3999E 01	0.13953E 01
		2		2	0.00	0.00	12.45	0.86864E 01	0.4333E 01	0.20113E 01	0.17283E 01	0.13953E 01
		3		3	0.00	0.00	12.45	0.96981E 01	0.70835E 00	0.24913E 01	0.17165E 01	0.13953E 01
		4		4	0.00	-20.32	12.45	0.17989E 01	0.3340E 01	0.17913E 01	0.17165E 01	0.13953E 01
		5		5	0.00	0.00	12.45	0.98022E 01	0.96933E 01	0.35233E 01	0.3290E 01	0.13953E 01
		6		6	0.00	-6.60	12.45	0.99140E 01	0.17671E 01	0.3290E 01	0.3290E 01	0.13953E 01
		7		7	0.00	0.00	12.45	0.10439E 02	0.20102E 01	0.00000E 00	0.00000E 00	0.13953E 01
		8		8	0.00	-20.32	12.45	0.92288E 01	0.20102E 01	0.00000E 00	0.00000E 00	0.13953E 01
		9		9	0.00	0.00	12.45	0.87933E 01	0.11980E 01	0.16519E 01	0.3290E 01	0.13953E 01
		10		10	0.00	-20.32	12.45	0.87933E 01	0.11980E 01	0.16519E 01	0.3290E 01	0.13953E 01



RVMT 242/243 SHIP WAKE TURBULENCE TEST

PWM VEL	ROLL TP	YAW PRIDE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
152 22.8	15.0	8	-20.0	9	0.00	-20.32	4.57	0.76562E 01	0.14594E 00	0.57471E 00	0.23492E 01
		10	0.00	0.00	0.00	0.13163E 02	0.93097E 01	0.22511E 01	0.16582E 01	0.11728E 01	0.14346E 01
	9	-30.0	1	0.00	0.00	0.76782E 01	0.98071E 00	0.34775E 01	0.32183E 01	0.45087E 01	0.37835E 01
			2	0.00	0.00	0.91549E 01	0.10215E 01	0.35721E 00	0.44158E 01	0.46787E 01	0.50069E 01
			3	0.00	0.00	0.18380E 02	0.13878E 01	0.30782E 01	0.20337E 01	0.24684E 01	0.21739E 01
			4	0.00	0.00	0.18380E 02	0.13878E 01	0.30782E 01	0.20337E 01	0.24684E 01	0.21739E 01
			5	0.00	0.00	0.20569E 02	0.15093E 01	0.33865E 01	0.32403E 01	0.3201E 00	0.46069E 00
			6	0.00	0.00	0.73412E 01	0.90093E 01	0.31230E 01	0.38384E 00	0.38934E 00	0.48447E 01
			7	0.00	0.00	0.73412E 01	0.90093E 01	0.31230E 01	0.38384E 00	0.38934E 00	0.48447E 01
			8	0.00	0.00	0.73412E 01	0.90093E 01	0.31230E 01	0.38384E 00	0.38934E 00	0.48447E 01
			9	0.00	0.00	0.73412E 01	0.90093E 01	0.31230E 01	0.38384E 00	0.38934E 00	0.48447E 01
			10	0.00	0.00	0.73412E 01	0.90093E 01	0.31230E 01	0.38384E 00	0.38934E 00	0.48447E 01
	10	-50.0	1	0.00	0.00	0.41185E 01	0.70807E 00	0.12160E 01	0.37710E 01	0.36813E 01	0.31960E 01
			2	0.00	0.00	0.41185E 01	0.70807E 00	0.12160E 01	0.37710E 01	0.36813E 01	0.31960E 01
			3	0.00	0.00	0.41185E 01	0.70807E 00	0.12160E 01	0.37710E 01	0.36813E 01	0.31960E 01
			4	0.00	0.00	0.41185E 01	0.70807E 00	0.12160E 01	0.37710E 01	0.36813E 01	0.31960E 01
			5	0.00	0.00	0.41185E 01	0.70807E 00	0.12160E 01	0.37710E 01	0.36813E 01	0.31960E 01
			6	0.00	0.00	0.41185E 01	0.70807E 00	0.12160E 01	0.37710E 01	0.36813E 01	0.31960E 01
			7	0.00	0.00	0.41185E 01	0.70807E 00	0.12160E 01	0.37710E 01	0.36813E 01	0.31960E 01
			8	0.00	0.00	0.41185E 01	0.70807E 00	0.12160E 01	0.37710E 01	0.36813E 01	0.31960E 01
			9	0.00	0.00	0.41185E 01	0.70807E 00	0.12160E 01	0.37710E 01	0.36813E 01	0.31960E 01
			10	0.00	0.00	0.41185E 01	0.70807E 00	0.12160E 01	0.37710E 01	0.36813E 01	0.31960E 01





SVMT 242/243 SHIP WAKE TURBULENCE TEST

PUM VEL	ROLL	YR	VAN PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
154 22.8	15.0	13	-20.0	9	4.59	4.57	0.8211E 01	-0.15475E 00	-0.21033E 01	0.19707E 01	0.25970E 01	0.21877E 01
				10	4.59	4.57	0.13201E 02	0.93366E 01	0.10233E 00	0.11770E 01	0.83242E 00	0.81255E 00
	14	-30.0		1	4.59	4.57	0.80229E 01	0.5189E 00	0.36801E 01	0.30426E 01	0.43806E 01	0.3004E 01
				2	4.59	4.57	0.98647E 01	0.09235E 00	0.11737E 01	0.37904E 01	0.44931E 01	0.3004E 01
				3	4.59	4.57	0.15009E 02	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
				4	4.59	4.57	0.20671E 01	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
				5	4.59	4.57	0.74359E 01	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
				6	4.59	4.57	0.13000E 01	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
				7	4.59	4.57	0.46063E 01	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
				8	4.59	4.57	0.13457E 02	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
				9	4.59	4.57	0.13457E 02	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
				10	4.59	4.57	0.13457E 02	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
	15	-50.0		1	4.59	4.57	0.29435E 01	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
				2	4.59	4.57	0.13009E 02	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
				3	4.59	4.57	0.19559E 02	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
				4	4.59	4.57	0.2510E 02	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
				5	4.59	4.57	0.2510E 02	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
				6	4.59	4.57	0.2510E 02	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
				7	4.59	4.57	0.2510E 02	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
				8	4.59	4.57	0.2510E 02	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
				9	4.59	4.57	0.2510E 02	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01
				10	4.59	4.57	0.2510E 02	0.00323E 00	0.13270E 01	0.37904E 01	0.44931E 01	0.3004E 01





BYMT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	NO. C	TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
155 10.2	15.0	9	-20.0	9	9.18	20.32	4.57	0.37909E 01	-0.45417E 00	-0.97881E 00	0.10694E 01	0.12069E 01
		10	-20.0	10	9.18	20.32	4.57	0.65918E 01	0.46620E 01	-0.46554E 01	0.42056E 00	0.172607E 01
	10	-30.0		1	9.18	6.00	4.57	0.48399E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				2	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				3	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				4	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				5	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				6	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				7	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				8	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				9	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				10	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
	11	-50.0		1	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				2	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				3	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				4	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				5	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				6	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				7	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				8	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				9	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
				10	9.18	6.00	4.57	0.51603E 01	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00







SVNT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VFL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
157	10.4	0.0	9	-20.0	10	9.18	-20.32	4.57	0.33910E 01	-0.24520E 00	-0.26784E 00	0.33957E 00	0.88971E 00	0.10119E 01
			10	-30.0		9.18	-20.32	4.57	0.33442E 01	-0.46284E 01	-0.39073E 01	0.61041E 00	0.43171E 00	0.10534E 01
			1			9.18	-6.00	4.5	0.29705E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			2			9.18	-6.00	4.5	0.29996E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			3			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			4			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			5			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			6			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			7			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			8			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			9			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			10			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			11			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			12			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			13			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			14			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			15			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			16			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			17			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			18			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			19			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00
			20			9.18	-6.00	4.5	0.30013E 01	0.13608E 00	0.13608E 00	0.15025E 00	0.00000E 00	0.00000E 00

[illegible]

RVNT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN	VX	VY	VZ	S.D.	VX	VY	VZ	S.D.	VZ
158	22.6	0.0	8	-20.0	9	9.18	-20.32	4.57	0.64920E 01	0.53746E 00	0.53746E 00	-0.80221E 00	0.19139E 01	0.19139E 01	0.19759E 01	0.18481E 01	0.19759E 01	0.18481E 01
					10	9.18	20.32	4.57	0.13345E 02	0.94391E 01	0.94391E 01	-0.10346E 00	0.11818E 01	0.11818E 01	0.13357E 01	0.91638E 02	0.13357E 01	0.91638E 02
					1	9.18	-6.60	2.5	0.52267E 00	0.10844E 00	0.10844E 00	0.25547E 00	0.37801E 00	0.37801E 00	0.37801E 00	0.37801E 00	0.37801E 00	0.37801E 00
					2	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					3	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					4	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					5	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					6	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					7	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					8	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					9	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					10	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					1	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					2	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					3	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					4	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					5	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					6	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					7	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					8	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					9	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00
					10	9.18	-6.60	2.5	0.10697E 00	0.10697E 00	0.10697E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00	0.00000E 00



SVNT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VFL	MOLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
159	10.9	0.0	2	0.0	1	23388	-6.60	12445	0.7218E	0.12356E	0.50273E	0.2297E	0.1015E	0.8850E
						23388	0.00	12445	0.5477E	0.15433E	0.25925E	0.1102E	0.1543E	0.9540E
						23388	-20.32	12445	0.9712E	0.04831E	0.38078E	0.1802E	0.1477E	0.4418E
						23388	-6.60	12445	0.9520E	0.18361E	0.27335E	0.1799E	0.2442E	0.6350E
						23388	-6.60	12445	0.5397E	0.1501E	0.27335E	0.1330E	0.1330E	0.3325E
						23388	-20.32	12445	0.9118E	0.05045E	0.53333E	0.1435E	0.1230E	0.2297E
						23388	0.00	12445	0.9118E	0.43000E	0.50739E	0.1043E	0.4988E	0.2297E
3	10.0					23388	-6.60	12445	0.8092E	0.4455E	0.13512E	0.3420E	0.0909E	0.4119E
						23388	-6.60	12445	0.7038E	0.24702E	0.22822E	0.2022E	0.1141E	0.5715E
						23388	-20.32	12445	0.6177E	0.51122E	0.29044E	0.4615E	0.1411E	0.5715E
						23388	-6.60	12445	0.5477E	0.10857E	0.20440E	0.1545E	0.2022E	0.3325E
						23388	-6.60	12445	0.9082E	0.23477E	0.10333E	0.2244E	0.2022E	0.3325E
						23388	-20.32	12445	0.5086E	0.36060E	0.65333E	0.1100E	0.1180E	0.3325E
4	30.0					23388	-6.60	12445	0.5477E	0.3753E	0.28005E	0.2622E	0.1780E	0.3325E
						23388	-6.60	12445	0.5477E	0.25213E	0.28005E	0.2622E	0.1780E	0.3325E
						23388	-20.32	12445	0.5477E	0.3753E	0.28005E	0.2622E	0.1780E	0.3325E
						23388	-6.60	12445	0.5477E	0.25213E	0.28005E	0.2622E	0.1780E	0.3325E
						23388	-20.32	12445	0.5477E	0.3753E	0.28005E	0.2622E	0.1780E	0.3325E
5	50.0					23388	-6.60	12445	0.9210E	0.10401E	0.20877E	0.1750E	0.1855E	0.1273E
						23388	-6.60	12445	0.5090E	0.31533E	0.40449E	0.3232E	0.2297E	0.1273E
						23388	-20.32	12445	0.1011E	0.48613E	0.11722E	0.3232E	0.2297E	0.1273E
						23388	-6.60	12445	0.3210E	0.09486E	0.51822E	0.2297E	0.2297E	0.1273E
						23388	-20.32	12445	0.3210E	0.09486E	0.51822E	0.2297E	0.2297E	0.1273E
7	70.0					23388	-6.60	12445	0.5477E	0.48613E	0.10005E	0.3232E	0.2297E	0.1273E
						23388	-6.60	12445	0.5477E	0.25213E	0.28005E	0.2622E	0.1780E	0.3325E
						23388	-20.32	12445	0.5477E	0.3753E	0.28005E	0.2622E	0.1780E	0.3325E
						23388	-6.60	12445	0.5477E	0.25213E	0.28005E	0.2622E	0.1780E	0.3325E
						23388	-20.32	12445	0.5477E	0.3753E	0.28005E	0.2622E	0.1780E	0.3325E
8	90.0					23388	-6.60	12445	0.5477E	0.48613E	0.10005E	0.3232E	0.2297E	0.1273E
						23388	-6.60	12445	0.5477E	0.25213E	0.28005E	0.2622E	0.1780E	0.3325E
						23388	-20.32	12445	0.5477E	0.3753E	0.28005E	0.2622E	0.1780E	0.3325E
						23388	-6.60	12445	0.5477E	0.25213E	0.28005E	0.2622E	0.1780E	0.3325E
						23388	-20.32	12445	0.5477E	0.3753E	0.28005E	0.2622E	0.1780E	0.3325E
9	-10.0					23388	-6.60	12445	0.5477E	0.48613E	0.10005E	0.3232E	0.2297E	0.1273E
						23388	-6.60	12445	0.5477E	0.25213E	0.28005E	0.2622E	0.1780E	0.3325E
						23388	-20.32	12445	0.5477E	0.3753E	0.28005E	0.2622E	0.1780E	0.3325E
						23388	-6.60	12445	0.5477E	0.25213E	0.28005E	0.2622E	0.1780E	0.3325E
						23388	-20.32	12445	0.5477E	0.3753E	0.28005E	0.2622E	0.1780E	0.3325E

BUWT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN	VX	VY	MEAN	VZ	S.D.	VX	S.D.	VY	S.D.	VZ	
159	10.9	0.0	9	-10.0	10	23.88	-20.32	4.57	0.8151E	01	-0.7309E	00	-0.45297E	00	0.7936E	00	0.3264E	00	0.8343E	00
						23.88	-20.32	4.57	0.8225E	01	-0.4388E	01	-0.5919E	02	0.6489E	00	0.4388E	00	0.3770E	01
10	-30.0	10	2	3	3	23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
						23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
						23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
						23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
						23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
11	-50.0	10	2	3	3	23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
						23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
						23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
						23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
						23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
12	-70.0	10	2	3	3	23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
						23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
						23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
						23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
						23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
13	-90.0	10	2	3	3	23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
						23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
						23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
						23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00
						23.88	-6.00	4.57	0.8151E	01	0.0000E	00	0.3653E	00	0.0000E	00	0.0000E	00	0.0000E	00

**BUWT 242/243 SHIP WAKE TURBULENCE TEST**

RUN	VFL	ROLL	YF	YAW	PITCH	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
160	22.3	0.0	1	0.0	1	23.88	-6.60	12.22	0.00	0.00	0.00	0.00	0.00	0.00
1	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
2	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
3	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
4	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
5	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
6	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
7	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
8	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
9	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
10	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
2	10.0	2	10.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
3	10.0	2	10.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
4	10.0	2	10.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
5	10.0	2	10.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
6	10.0	2	10.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
7	10.0	2	10.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
8	10.0	2	10.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
9	10.0	2	10.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
10	10.0	2	10.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
3	30.0	3	30.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
4	30.0	3	30.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
5	30.0	3	30.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
6	30.0	3	30.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
7	30.0	3	30.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
8	30.0	3	30.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
9	30.0	3	30.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
10	30.0	3	30.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
4	50.0	4	50.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
1	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
2	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
3	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
4	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
5	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
6	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
7	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
8	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
9	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
10	0.0	1	0.0	0.0	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
2	70.0	5	70.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
3	70.0	5	70.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
4	70.0	5	70.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
5	70.0	5	70.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
6	70.0	5	70.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
7	70.0	5	70.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
8	70.0	5	70.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
9	70.0	5	70.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
10	70.0	5	70.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
2	90.0	6	90.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
3	90.0	6	90.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
4	90.0	6	90.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
5	90.0	6	90.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
6	90.0	6	90.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
7	90.0	6	90.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
8	90.0	6	90.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
9	90.0	6	90.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00
10	90.0	6	90.0	1	23.88	0.00	0.00	12.22	0.00	0.00	0.00	0.00	0.00	0.00



'BVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VFL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
161	17.2	15.0	9	-20.0	10	4.59	-20.32	4.57	0.3552E-01	-0.3742E-01	0.2572E-01	0.10594E-01	0.1038E-01	0.93629E-00
						4.59	20.32	4.57	0.6274E-01	0.4433E-01	-0.5829E-02	0.25512E-00	0.4420E-00	0.3728E-01
		10	-30.0		1	4.59	-6.60	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					2	4.59	6.60	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					3	4.59	6.60	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					4	4.59	20.32	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					5	4.59	20.32	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					6	4.59	-6.60	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					7	4.59	6.60	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					8	4.59	6.60	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					9	4.59	-20.32	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					10	4.59	20.32	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
		11	-50.0		1	4.59	-6.60	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					2	4.59	6.60	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					3	4.59	6.60	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					4	4.59	20.32	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					5	4.59	20.32	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					6	4.59	-6.60	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					7	4.59	6.60	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					8	4.59	6.60	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					9	4.59	-20.32	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01
					10	4.59	20.32	4.57	0.2435E-01	0.3647E-01	0.1320E-01	0.1819E-01	0.2250E-01	0.1678E-01

**BVMT 242/243**

[illegible]



## BVWT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]



BMVT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
163 10-8	15-0	8	-20-0	10	0-00	-20-32	4-57	0-42669E-01	0-55571E-01	0-50756E 00	0-10233E 01	0-10023E 01	0-10838E 01
					0-00	20-32	4-57	0-19981E-01	-3-28252E-01	0-00000E 00	0-27073E-02	0-38279E-02	0-00000E 00
	9	-30-0		1	0-00	-6-00	4-57	0-24450E-01	0-27412E-01	0-31857E 00	0-18952E 01	0-20103E 01	0-19445E 01
				2	0-00	-6-00	4-57	0-23309E-01	0-65562E-01	0-0-28447E 00	0-24447E 01	0-20103E 01	0-19445E 01
				3	0-00	-6-00	4-57	0-87454E-01	0-14390E-01	0-0-28447E 00	0-24447E 01	0-20103E 01	0-19445E 01
				4	0-00	-20-32	4-57	0-74631E-01	0-60055E-01	0-0-28447E 00	0-24447E 01	0-20103E 01	0-19445E 01
				5	0-00	-20-32	4-57	0-98530E-01	0-10255E-01	0-0-28447E 00	0-24447E 01	0-20103E 01	0-19445E 01
				6	0-00	-6-00	4-57	0-13757E-01	0-11651E-01	0-0-28447E 00	0-24447E 01	0-20103E 01	0-19445E 01
				8	0-00	-20-32	4-57	0-33170E-01	-0-32552E-01	0-0-28447E 00	0-24447E 01	0-20103E 01	0-19445E 01
				10	0-00	-20-32	4-57	0-33170E-01	-0-32552E-01	0-0-28447E 00	0-24447E 01	0-20103E 01	0-19445E 01
	10	-30-0		1	0-00	-6-00	4-57	0-19107E-01	0-85570E-01	0-0-28447E 00	0-24447E 01	0-20103E 01	0-19445E 01
				2	0-00	-6-00	4-57	0-19107E-01	0-85570E-01	0-0-28447E 00	0-24447E 01	0-20103E 01	0-19445E 01
				3	0-00	-6-00	4-57	0-19107E-01	0-85570E-01	0-0-28447E 00	0-24447E 01	0-20103E 01	0-19445E 01
				4	0-00	-20-32	4-57	0-19107E-01	0-85570E-01	0-0-28447E 00	0-24447E 01	0-20103E 01	0-19445E 01
				5	0-00	-20-32	4-57	0-19107E-01	0-85570E-01	0-0-28447E 00	0-24447E 01	0-20103E 01	0-19445E 01
				6	0-00	-6-00	4-57	0-19107E-01	0-85570E-01	0-0-28447E 00	0-24447E 01	0-20103E 01	0-19445E 01
				8	0-00	-20-32	4-57	0-19107E-01	0-85570E-01	0-0-28447E 00	0-24447E 01	0-20103E 01	0-19445E 01
				10	0-00	-20-32	4-57	0-19107E-01	0-85570E-01	0-0-28447E 00	0-24447E 01	0-20103E 01	0-19445E 01





BVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN	VX	MEAN	VY	MEAN	VZ	S.D.	VX	S.D.	VY	S.D.	VZ
165	10.4	0.0	2	10.0	1	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					2	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					3	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					4	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					5	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					6	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					7	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					8	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					9	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					10	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
3	0.0				1	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					2	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					3	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					4	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					5	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					6	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					7	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					8	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					9	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					10	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
4	-10.0				1	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					2	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					3	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					4	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					5	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					6	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					7	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					8	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					9	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50
					10	9.65	-6.60	2.22	0.73	1.51	0.00	0.54	0.14	0.91	0.00	0.85	0.00	0.76	0.00	0.50

[illegible]

# BVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
167	22.5	0.0	1	0.0	1	-9.65	-6.60	12.45	0.10851E	-0.89197E	0.15086E	0.23634E	0.2402E	0.2554E
					2	-9.65	0.00	12.45	0.10851E	-0.89197E	0.15086E	0.23634E	0.2402E	0.2554E
					3	-9.65	0.00	12.45	0.10851E	-0.89197E	0.15086E	0.23634E	0.2402E	0.2554E
					4	-9.65	0.00	12.45	0.10851E	-0.89197E	0.15086E	0.23634E	0.2402E	0.2554E
					5	-9.65	0.00	12.45	0.10851E	-0.89197E	0.15086E	0.23634E	0.2402E	0.2554E
					6	-9.65	0.00	12.45	0.10851E	-0.89197E	0.15086E	0.23634E	0.2402E	0.2554E
					7	-9.65	0.00	12.45	0.10851E	-0.89197E	0.15086E	0.23634E	0.2402E	0.2554E
					8	-9.65	0.00	12.45	0.10851E	-0.89197E	0.15086E	0.23634E	0.2402E	0.2554E
					9	-9.65	0.00	12.45	0.10851E	-0.89197E	0.15086E	0.23634E	0.2402E	0.2554E
					10	-9.65	0.00	12.45	0.10851E	-0.89197E	0.15086E	0.23634E	0.2402E	0.2554E

BNVT 242/243 SHIP WAKE TURBULENCE TEST

SHIP VEL	ROLL TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
160 10-4	0.0	5	180.0	-6.60	2.54	0.69003E 01	0.30075E 00	-0.79303E 00	0.12777E 01	0.16905E 01	0.13927E 01
				0.00		0.41786E 01	0.95510E 00	-0.12805E 00	0.31953E 01	0.24664E 01	0.20422E 01
				6.60		0.67279E 01	0.40596E 00	-0.94853E 00	0.02310E 00	0.20300E 00	0.13927E 01
				20.32		0.11146E 02	0.20876E 00	-0.14177E 00	0.41810E 00	0.90000E 00	0.08491E 00
				40.64		0.10504E 02	0.45116E 00	-0.99777E 00	0.31953E 01	0.82522E 00	0.20422E 01
				20.32		0.10472E 02	0.34409E 01	-0.67827E 00	0.29862E 00	0.50900E 00	0.49606E 00
6 155.0				-6.60	2.54	0.67172E 01	0.34409E 01	-0.20637E 01	0.58620E 00	0.21034E 00	0.20882E 00
				0.00		0.57105E 01	0.95510E 00	-0.12805E 00	0.31953E 01	0.24664E 01	0.20422E 01
				6.60		0.57105E 01	0.40596E 00	-0.94853E 00	0.02310E 00	0.20300E 00	0.13927E 01
				20.32		0.10888E 02	0.33326E 00	-0.24435E 00	0.41810E 00	0.71132E 00	0.20422E 01
				40.64		0.10314E 02	0.33326E 00	-0.24435E 00	0.41810E 00	0.71132E 00	0.20422E 01
				20.32		0.11018E 02	0.12070E 01	-0.24033E 01	0.23005E 00	0.36315E 00	0.33674E 00
8 210.0				-6.60	2.54	0.61090E 01	0.67076E 01	-0.14803E 00	0.6058E 01	0.12080E 01	0.9817E 00
				0.00		0.81759E 01	0.95510E 00	-0.12805E 00	0.31953E 01	0.24664E 01	0.20422E 01
				6.60		0.10448E 02	0.40596E 00	-0.94853E 00	0.02310E 00	0.20300E 00	0.13927E 01
				20.32		0.11789E 02	0.22222E 00	-0.10877E 00	0.41810E 00	0.53998E 00	0.47915E 00
				40.64		0.11789E 02	0.22222E 00	-0.10877E 00	0.41810E 00	0.53998E 00	0.47915E 00
				20.32		0.82473E 01	0.11607E 01	-0.14270E 01	0.25047E 00	0.27442E 00	0.27966E 00
10 220.0				-6.60	2.54	0.82473E 01	0.11607E 01	-0.14270E 01	0.25047E 00	0.27442E 00	0.27966E 00
				0.00		0.79244E 01	0.34409E 01	-0.15104E 01	0.17593E 01	0.30988E 01	0.10134E 01
				6.60		0.79244E 01	0.40596E 00	-0.94853E 00	0.02310E 00	0.20300E 00	0.13927E 01
				20.32		0.10448E 02	0.40596E 00	-0.94853E 00	0.02310E 00	0.20300E 00	0.13927E 01
				40.64		0.11607E 02	0.12070E 01	-0.24033E 01	0.23005E 00	0.36315E 00	0.33674E 00
				20.32		0.54408E 01	0.36270E 01	-0.26003E 01	0.33948E 00	0.32442E 00	0.27966E 00

BVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VFL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
169	22.7	0.0	2	155.0	1	4.57	-6.60	2.54	0.2285E 02	0.9013E 01	0.3482E 01	0.7528E 00	0.1485E 01	0.1400E 01
					2	4.57	0.00	2.54	0.1359E 02	0.0000E 00	0.3482E 01	0.0000E 00	0.1485E 01	0.1400E 01
					3	4.57	6.60	2.54	0.1020E 02	0.1100E 01	0.1917E 01	0.1642E 00	0.1075E 01	0.0830E 00
					4	4.57	20.32	2.54	0.2012E 02	0.0805E 01	0.4397E 01	0.3148E 00	0.2857E 01	0.2647E 00
					5	4.57	40.64	2.54	0.2157E 02	0.7053E 01	0.2971E 01	0.6800E 00	0.1617E 01	0.9465E 00
					6	4.57	-40.64	2.54	0.2133E 02	0.7037E 01	0.2971E 01	0.5385E 00	0.1533E 01	0.1204E 00
					7	4.57	-20.32	2.54	0.2406E 02	0.1054E 01	0.4810E 01	0.2985E 00	0.5329E 01	0.5176E 00
3 180.0														
					1	4.57	-6.60	2.54	0.1703E 02	0.5319E 01	0.1422E 01	0.3402E 01	0.3137E 01	0.3141E 01
					2	4.57	6.60	2.54	0.1020E 02	0.1100E 01	0.1917E 01	0.6644E 00	0.3842E 01	0.4027E 01
					3	4.57	20.32	2.54	0.1359E 02	0.1089E 01	0.4460E 01	0.6644E 00	0.3842E 01	0.4027E 01
					4	4.57	40.64	2.54	0.2012E 02	0.5737E 01	0.2747E 01	0.4053E 00	0.9120E 01	0.8723E 01
					5	4.57	-40.64	2.54	0.2269E 02	0.5049E 01	0.6123E 01	0.4282E 00	0.9120E 01	0.8723E 01
					6	4.57	-20.32	2.54	0.2315E 02	0.8362E 01	0.3830E 01	0.3179E 00	0.1452E 01	0.8086E 00
4 210.0														
					1	4.57	-6.60	2.54	0.1533E 02	0.1321E 01	0.3623E 01	0.2362E 01	0.1409E 01	0.1519E 01
					2	4.57	6.60	2.54	0.1733E 02	0.8404E 01	0.1778E 01	0.4222E 01	0.4233E 01	0.4210E 01
					3	4.57	20.32	2.54	0.2209E 02	0.1431E 01	0.2208E 01	0.6853E 00	0.7080E 01	0.8824E 00
					4	4.57	40.64	2.54	0.2489E 02	0.4291E 01	0.8658E 01	0.3942E 00	0.5977E 01	0.6048E 00
					5	4.57	-40.64	2.54	0.2501E 02	0.3651E 01	0.8658E 01	0.5222E 00	0.9661E 01	0.5060E 00
					6	4.57	-20.32	2.54	0.2274E 02	0.5063E 01	0.4282E 01	0.2604E 00	0.1738E 01	0.1843E 00
5 220.0														
					1	4.57	-6.60	2.54	0.1859E 02	0.1404E 01	0.3525E 01	0.1497E 01	0.6887E 01	0.3317E 00
					2	4.57	6.60	2.54	0.1949E 02	0.1918E 01	0.3332E 01	0.4280E 00	0.9113E 01	0.4488E 01
					3	4.57	20.32	2.54	0.2271E 02	0.1468E 01	0.2629E 01	0.6868E 00	0.9742E 01	0.1359E 01
					4	4.57	40.64	2.54	0.2499E 02	0.4468E 01	0.9674E 01	0.3037E 00	0.6216E 01	0.5542E 00
					5	4.57	-40.64	2.54	0.2522E 02	0.3327E 01	0.1133E 01	0.3470E 00	0.8361E 01	0.4717E 00
					6	4.57	-20.32	2.54	0.1422E 02	0.6183E 01	0.4333E 01	0.3580E 00	0.2122E 01	0.6811E 00



SVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN VFL	ROLL TP	YAW PRUBF	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
170 10.3	0.0	2 150.0	0.00	-6.60	2.54	0.1056E 02	0.3410E 01	0.1054E 01	0.1083E 01	0.1217E 01	0.1031E 01
			0.00	0.00	2.54	0.1065E 02	0.4330E 01	0.1112E 01	0.1209E 01	0.1473E 01	0.1251E 01
			0.00	0.00	2.54	0.8228E 00	0.3322E 00	0.3960E 00	0.4613E 00	0.1869E 00	0.1758E 00
			0.00	20.32	2.54	0.9490E 00	0.1301E 00	0.1428E 00	0.3803E 00	0.1866E 00	0.1731E 00
			0.00	20.64	2.54	0.1072E 02	0.1812E 01	0.1596E 01	0.3070E 00	0.1799E 00	0.3733E 00
			0.00	-20.64	2.54	0.1115E 02	0.1198E 01	0.0613E 01	0.2442E 00	0.6091E 00	0.5236E 00
			0.00	-20.32	2.54	0.1159E 02	0.1198E 01	0.2809E 01	0.2222E 00	0.3161E 00	0.2352E 00
3 120.0			0.00	-6.60	2.54	0.1337E 02	0.3201E 01	0.5901E 00	0.1517E 01	0.885E 01	0.1343E 01
			0.00	0.00	2.54	0.1370E 02	0.3201E 01	0.5901E 00	0.1517E 01	0.1641E 01	0.1343E 01
			0.00	0.00	2.54	0.6227E 00	0.3318E 00	0.6733E 00	0.4124E 00	0.3182E 00	0.3023E 00
			0.00	20.32	2.54	0.2627E 00	0.3318E 00	0.6733E 00	0.4124E 00	0.1487E 00	0.1704E 00
			0.00	20.64	2.54	0.9793E 00	0.1305E 00	0.1988E 00	0.2343E 00	0.5124E 00	0.3706E 00
			0.00	-20.64	2.54	0.1263E 02	0.2212E 01	0.2053E 01	0.3421E 00	0.4624E 00	0.8182E 00
			0.00	-20.32	2.54	0.6933E 01	0.3201E 01	0.2053E 01	0.3421E 00	0.1043E 01	0.8182E 00
4 180.0			0.00	-6.60	2.54	0.6933E 01	0.3201E 01	0.2053E 01	0.3421E 00	0.1333E 01	0.1093E 01
			0.00	0.00	2.54	0.6933E 01	0.3201E 01	0.2053E 01	0.3421E 00	0.1333E 01	0.1093E 01
			0.00	0.00	2.54	0.6933E 01	0.3201E 01	0.2053E 01	0.3421E 00	0.1333E 01	0.1093E 01
			0.00	20.32	2.54	0.6933E 01	0.3201E 01	0.2053E 01	0.3421E 00	0.1333E 01	0.1093E 01
			0.00	20.64	2.54	0.1333E 01	0.3201E 01	0.2053E 01	0.3421E 00	0.1333E 01	0.1093E 01
			0.00	-20.64	2.54	0.1054E 02	0.2485E 01	0.1353E 01	0.1652E 00	0.3083E 00	0.1701E 00
			0.00	-20.32	2.54	0.1054E 02	0.2485E 01	0.1353E 01	0.1652E 00	0.2605E 00	0.1866E 00
5 210.0			0.00	-6.60	2.54	0.1233E 02	0.4336E 01	0.2783E 01	0.1806E 01	0.6933E 00	0.1395E 01
			0.00	0.00	2.54	0.1233E 02	0.4336E 01	0.2783E 01	0.1806E 01	0.6933E 00	0.1395E 01
			0.00	0.00	2.54	0.1067E 02	0.5599E 01	0.3730E 01	0.6522E 00	0.6122E 00	0.5624E 00
			0.00	20.32	2.54	0.1067E 02	0.5599E 01	0.3730E 01	0.6522E 00	0.1073E 01	0.6030E 00
			0.00	20.64	2.54	0.1219E 02	0.9168E 00	0.4134E 00	0.4304E 00	0.5086E 00	0.4302E 00
			0.00	-20.64	2.54	0.1219E 02	0.3453E 01	0.1805E 01	0.4304E 00	0.4650E 00	0.4368E 00
			0.00	-20.32	2.54	0.8719E 01	0.4130E 01	0.1867E 01	0.2303E 00	0.4059E 00	0.9282E 00
6 235.0			0.00	-6.60	2.54	0.6237E 02	0.3877E 01	0.6234E 01	0.3737E 01	0.3718E 01	0.2623E 01
			0.00	0.00	2.54	0.6237E 02	0.3877E 01	0.6234E 01	0.3737E 01	0.3718E 01	0.2623E 01
			0.00	0.00	2.54	0.1067E 02	0.5599E 01	0.3730E 01	0.6522E 00	0.1073E 01	0.6030E 00
			0.00	20.32	2.54	0.1067E 02	0.5599E 01	0.3730E 01	0.6522E 00	0.1073E 01	0.6030E 00
			0.00	20.64	2.54	0.1219E 02	0.9168E 00	0.4134E 00	0.4304E 00	0.5086E 00	0.4302E 00
			0.00	-20.64	2.54	0.1219E 02	0.3453E 01	0.1805E 01	0.4304E 00	0.4650E 00	0.4368E 00
			0.00	-20.32	2.54	0.8719E 01	0.4130E 01	0.1867E 01	0.2303E 00	0.4059E 00	0.9282E 00
			0.00	0.00	2.54	0.6237E 02	0.3877E 01	0.6234E 01	0.3737E 01	0.3718E 01	0.2623E 01
			0.00	0.00	2.54	0.1067E 02	0.5599E 01	0.3730E 01	0.6522E 00	0.1073E 01	0.6030E 00
			0.00	20.32	2.54	0.1067E 02	0.5599E 01	0.3730E 01	0.6522E 00	0.1073E 01	0.6030E 00
			0.00	20.64	2.54	0.1219E 02	0.9168E 00	0.4134E 00	0.4304E 00	0.5086E 00	0.4302E 00
			0.00	-20.64	2.54	0.1219E 02	0.3453E 01	0.1805E 01	0.4304E 00	0.4650E 00	0.4368E 00
			0.00	-20.32	2.54	0.8719E 01	0.4130E 01	0.1867E 01	0.2303E 00	0.4059E 00	0.9282E 00



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PUN VEL	ROLL	TP	YAW	PRIME	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
172 10.3	0.0	2	150.0	1	4.59	-6.00	2.54	0.1697E+00	0.2672E+00	0.3877E+00	0.6253E+00	0.3359E+00	0.1055E+01
				2	4.59	0.00	2.54	0.1019E+00	0.2333E+00	0.3318E+00	0.3202E+00	0.3252E+00	0.1444E+00
				3	4.59	6.00	2.54	0.0394E+00	0.1787E+00	0.3373E+00	0.3201E+00	0.3178E+00	0.0031E+00
				4	4.59	20.32	2.54	0.1051E+00	0.1448E+00	0.3440E+00	0.3201E+00	0.4561E+00	0.0788E+00
				5	4.59	-40.64	2.54	0.1150E+00	0.3235E+00	0.3404E+00	0.1233E+00	0.3513E+00	0.0797E+00
				6	4.59	-20.32	2.54	0.1150E+00	0.1073E+00	0.3793E+00	0.1233E+00	0.2043E+00	0.1296E+00
	3	120.0		1	4.59	-6.00	2.54	0.1149E+00	0.3569E+00	0.1554E+00	0.1337E+00	0.1564E+00	0.1443E+00
				2	4.59	0.00	2.54	0.0541E+00	0.4783E+00	0.3370E+00	0.0020E+00	0.1500E+00	0.0021E+00
				3	4.59	6.00	2.54	0.0337E+00	0.2233E+00	0.3708E+00	0.0020E+00	0.1524E+00	0.0021E+00
				4	4.59	20.32	2.54	0.0337E+00	0.1787E+00	0.3708E+00	0.0020E+00	0.1524E+00	0.0021E+00
				5	4.59	-40.64	2.54	0.0337E+00	0.1787E+00	0.3708E+00	0.0020E+00	0.1524E+00	0.0021E+00
				6	4.59	-20.32	2.54	0.0337E+00	0.1787E+00	0.3708E+00	0.0020E+00	0.1524E+00	0.0021E+00
	4	180.0		1	4.59	-6.00	2.54	0.1029E+00	0.1500E+00	0.5720E+00	0.2427E+00	0.3021E+00	0.0219E+00
				2	4.59	0.00	2.54	0.0829E+00	0.1500E+00	0.5720E+00	0.2427E+00	0.3021E+00	0.0219E+00
				3	4.59	6.00	2.54	0.0829E+00	0.1500E+00	0.5720E+00	0.2427E+00	0.3021E+00	0.0219E+00
				4	4.59	20.32	2.54	0.0829E+00	0.1500E+00	0.5720E+00	0.2427E+00	0.3021E+00	0.0219E+00
				5	4.59	-40.64	2.54	0.0829E+00	0.1500E+00	0.5720E+00	0.2427E+00	0.3021E+00	0.0219E+00
				6	4.59	-20.32	2.54	0.0829E+00	0.1500E+00	0.5720E+00	0.2427E+00	0.3021E+00	0.0219E+00
	5	210.0		1	4.59	-6.00	2.54	0.1097E+00	0.3973E+00	0.2948E+00	0.5533E+00	0.3096E+00	0.1299E+00
				2	4.59	0.00	2.54	0.1130E+00	0.3973E+00	0.2948E+00	0.5533E+00	0.3096E+00	0.1299E+00
				3	4.59	6.00	2.54	0.1130E+00	0.3973E+00	0.2948E+00	0.5533E+00	0.3096E+00	0.1299E+00
				4	4.59	20.32	2.54	0.1130E+00	0.3973E+00	0.2948E+00	0.5533E+00	0.3096E+00	0.1299E+00
				5	4.59	-40.64	2.54	0.1130E+00	0.3973E+00	0.2948E+00	0.5533E+00	0.3096E+00	0.1299E+00
				6	4.59	-20.32	2.54	0.1130E+00	0.3973E+00	0.2948E+00	0.5533E+00	0.3096E+00	0.1299E+00
	6	250.0		1	4.59	-6.00	2.54	0.1253E+00	0.3096E+00	0.3273E+00	0.9914E+00	0.3096E+00	0.0910E+00
				2	4.59	0.00	2.54	0.1253E+00	0.3096E+00	0.3273E+00	0.9914E+00	0.3096E+00	0.0910E+00
				3	4.59	6.00	2.54	0.1253E+00	0.3096E+00	0.3273E+00	0.9914E+00	0.3096E+00	0.0910E+00
				4	4.59	20.32	2.54	0.1253E+00	0.3096E+00	0.3273E+00	0.9914E+00	0.3096E+00	0.0910E+00
				5	4.59	-40.64	2.54	0.1253E+00	0.3096E+00	0.3273E+00	0.9914E+00	0.3096E+00	0.0910E+00
				6	4.59	-20.32	2.54	0.1253E+00	0.3096E+00	0.3273E+00	0.9914E+00	0.3096E+00	0.0910E+00

BVMT 242/243 SHIP WAKE TURBULENCE TEST

PUN VEL	ROLL TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
173 22.7	0.0	2 150.0	4.59	-6.60	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	0.00	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	0.00	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	20.32	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	-40.64	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	-20.32	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
	3 120.0		4.59	-6.60	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	0.00	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	0.00	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	20.32	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	-40.64	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	-20.32	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
	4 180.0		4.59	-6.60	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	0.00	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	0.00	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	20.32	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	-40.64	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	-20.32	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
	5 210.0		4.59	-6.60	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	0.00	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	0.00	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	20.32	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	-40.64	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	-20.32	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
	6 240.0		4.59	-6.60	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	0.00	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	0.00	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	20.32	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	-40.64	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01
			4.59	-20.32	2.54	0.24806E 02	0.5531E 01	0.94402E 00	0.1481E 01	0.2925E 01	0.19015E 01



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RUN VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
175 22.8	0.0	2	150.0	1	9.18	-6.60	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				3	9.18	0.00	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				4	9.18	0.00	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				5	9.18	20.32	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				6	9.18	-20.32	2.54	0.27	0.57	0.11	0.31	0.19	0.14
		3	120.0	1	9.18	-6.60	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				3	9.18	0.00	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				4	9.18	0.00	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				5	9.18	20.32	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				6	9.18	-20.32	2.54	0.27	0.57	0.11	0.31	0.19	0.14
		5	180.0	1	9.18	-6.60	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				3	9.18	0.00	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				4	9.18	0.00	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				5	9.18	20.32	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				6	9.18	-20.32	2.54	0.27	0.57	0.11	0.31	0.19	0.14
		5	210.0	1	9.18	-6.60	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				3	9.18	0.00	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				4	9.18	0.00	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				5	9.18	20.32	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				6	9.18	-20.32	2.54	0.27	0.57	0.11	0.31	0.19	0.14
		6	240.0	1	9.18	-6.60	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				3	9.18	0.00	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				4	9.18	0.00	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				5	9.18	20.32	2.54	0.27	0.57	0.11	0.31	0.19	0.14
				6	9.18	-20.32	2.54	0.27	0.57	0.11	0.31	0.19	0.14



SVNT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
177	23.1	0.0	12	210.0	4	23.88	20.32	2.54	0.26318E 02	-0.49558E 01	-0.4084E 01	0.33859E 00	0.67564E 00	0.65084E 00
					5	23.88	40.64	2.54	0.26318E 02	-0.17204E 01	-0.39679E 00	0.23792E 00	0.79339E 00	0.43606E 00
					6	23.88	-40.64	2.54	0.21721E 02	-0.92493E 01	0.39717E 01	0.34056E 00	0.39076E 00	0.23558E 00
					7	23.88	-20.32	2.54	0.20576E 02	-0.28479E 01	0.11584E 01	0.19914E 00	0.84293E 00	0.37113E 00
			13	240.0	1	23.88	-6.60	2.54	0.17154E 02	-0.24799E 01	0.30074E 01	0.51367E 00	0.14640E 01	0.64814E 00
					2	23.88	0.00	2.54	0.18811E 02	-0.49331E 01	0.59579E 01	0.45147E 00	0.13105E 01	0.58104E 00
					3	23.88	6.60	2.54	0.18811E 02	-0.65761E 01	0.52413E 01	0.26075E 00	0.26279E 00	0.25537E 00
					4	23.88	20.32	2.54	0.22259E 02	-0.83747E 01	0.53667E 01	0.36623E 00	0.54631E 00	0.25537E 00
					5	23.88	-20.32	2.54	0.33538E 02	-0.48417E 01	0.14552E 01	0.35879E 00	0.72076E 01	0.22147E 00
					6	23.88	-40.64	2.54	0.19914E 02	-0.83818E 01	0.18552E 01	0.37743E 00	0.72076E 01	0.22147E 00
					7	23.88	-20.32	2.54	0.16582E 02	-0.47979E 01	0.45550E 01	0.51492E 00	0.12461E 01	0.10853E 00



OVWT 242/243 SHIP WAKE TURBULENCE TEST

[illegible]

**BVNT.242/243 SHIP WAKE TURBULENCE TEST**

[illegible]

**BVWT 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]

**BVWT 242/243 SHIP WAKE TURBULENCE TEST**

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**BVWT 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]

## BVWT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VFL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN	VX	MEAN	VY	MEAN	VZ	S.D.	VX	S.D.	VY	S.D.	VZ
183	22.8	0.0	2	150.0	1	9.18	-6.60	6.34	0.23539E	02	0.41135E	01	0.3557E	00	0.3675E	00	0.3138E	00	0.59804E	00
					3	9.18	0.00	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					4	9.18	20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					5	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					6	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					7	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					8	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					9	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					10	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					11	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					12	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					13	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					14	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					15	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					16	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					17	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					18	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					19	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					20	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					21	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					22	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					23	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					24	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					25	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					26	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					27	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					28	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					29	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					30	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					31	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					32	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					33	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					34	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					35	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					36	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					37	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					38	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					39	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					40	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					41	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					42	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					43	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					44	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					45	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					46	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					47	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					48	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					49	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					50	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					51	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					52	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					53	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					54	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					55	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					56	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					57	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					58	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					59	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					60	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					61	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					62	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					63	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					64	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					65	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					66	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					67	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					68	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					69	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00	0.3136E	00	0.59821E	00
					70	9.18	-20.32	6.34	0.23539E	02	0.30721E	01	0.32355E	01	0.35807E	00				

## BVWT 242/243 SHIP WAKE TURBULENCE TEST

MIN VEL	ROLL	TP	YAW	PROF	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
184	10.3	0.0	2	150.0	1	-6.60	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	0.00	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	0.00	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	20.32	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	20.32	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	-20.32	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
3	120.0	1	3	120.0	1	-6.60	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	0.00	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	0.00	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	20.32	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	20.32	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	-20.32	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4	180.0	1	4	180.0	1	-6.60	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	0.00	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	0.00	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	20.32	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	20.32	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	-20.32	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
5	210.0	1	5	210.0	1	-6.60	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	0.00	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	0.00	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	20.32	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	20.32	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	-20.32	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
6	240.0	1	6	240.0	1	-6.60	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	0.00	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	0.00	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	20.32	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	20.32	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00
4.59					4.59	-20.32	6.34	0.1178E+02	0.2260E+01	0.4002E+00	0.3101E+00	0.6205E+01	0.35620E+00

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PUM VEL	ROLL	TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
105 22.6	0.0	2	150.0	4.59	-6.60	6.34	0.2407E 02	0.3738E 01	-0.1267E 01	0.3502E 00	0.7780E 00	0.5943E 00
				4.59	0.00	6.34	0.2391E 02	0.3675E 00	0.4014E 00	0.3798E 00	0.8016E 00	0.5391E 00
				4.59	20.32	6.34	0.2196E 02	0.3905E 00	0.3402E 01	0.3637E 00	0.1078E 00	0.4725E 00
				4.59	40.64	6.34	0.2286E 02	0.3346E 00	0.1580E 01	0.4022E 00	0.8867E 00	0.5475E 00
				4.59	-40.64	6.34	0.2471E 02	0.3503E 01	0.1702E 01	0.3274E 00	0.1064E 00	0.5306E 00
				4.59	-20.32	6.34	0.2475E 02	0.1001E 01	0.4893E 01	0.2872E 00	0.9077E 00	0.6377E 00
		3	120.0	4.59	-6.60	6.34	0.2581E 02	0.4291E 01	0.3722E 00	0.4767E 00	0.1208E 01	0.7511E 00
				4.59	0.00	6.34	0.2667E 02	0.6317E 01	0.4228E 01	0.1022E 01	0.2782E 01	0.1515E 01
				4.59	20.32	6.34	0.2312E 02	0.3979E 01	0.6352E 01	0.1130E 01	0.2355E 01	0.2140E 01
				4.59	40.64	6.34	0.1899E 02	0.3071E 01	0.5796E 01	0.1264E 00	0.1490E 01	0.1707E 01
				4.59	-40.64	6.34	0.1892E 02	0.4029E 01	0.5458E 01	0.4989E 00	0.1413E 01	0.6669E 00
				4.59	-20.32	6.34	0.2655E 02	0.5768E 01	0.9184E 01	0.3878E 00	0.1465E 01	0.8523E 00
		4	180.0	4.59	-6.60	6.34	0.2190E 02	0.2414E 00	0.3365E 01	0.3203E 00	0.8644E 00	0.4493E 00
				4.59	0.00	6.34	0.2384E 02	0.7191E 01	0.1706E 00	0.2997E 00	0.8490E 01	0.8035E 00
				4.59	20.32	6.34	0.2169E 02	0.3354E 01	0.4278E 01	0.7383E 00	0.1249E 01	0.1042E 01
				4.59	40.64	6.34	0.2386E 02	0.2231E 01	0.3397E 01	0.3033E 00	0.5903E 00	0.5226E 00
				4.59	-40.64	6.34	0.2465E 02	0.1833E 01	0.1991E 01	0.5037E 00	0.9433E 00	0.5894E 01
				4.59	-20.32	6.34	0.2215E 02	0.8379E 01	0.2484E 01	0.6018E 00	0.1119E 01	0.5195E 00
		5	210.0	4.59	-6.60	6.34	0.2065E 02	0.2506E 01	0.9189E 00	0.2803E 00	0.8456E 01	0.4493E 00
				4.59	0.00	6.34	0.2384E 02	0.7191E 01	0.5512E 01	0.6139E 00	0.8436E 01	0.6151E 01
				4.59	20.32	6.34	0.2384E 02	0.9586E 01	0.3709E 01	0.6119E 00	0.1866E 01	0.1722E 01
				4.59	40.64	6.34	0.2384E 02	0.9586E 01	0.3709E 01	0.6119E 00	0.1866E 01	0.1722E 01
				4.59	-40.64	6.34	0.2384E 02	0.9586E 01	0.3709E 01	0.6119E 00	0.1866E 01	0.1722E 01
				4.59	-20.32	6.34	0.1926E 02	0.4740E 01	0.4002E 01	0.3394E 00	0.8070E 00	0.5268E 00
		6	240.0	4.59	-6.60	6.34	0.2384E 02	0.8037E 01	0.6977E 01	0.3070E 00	0.1582E 01	0.9424E 00
				4.59	0.00	6.34	0.2435E 02	0.1042E 01	0.5891E 01	0.7392E 00	0.3720E 00	0.3901E 00
				4.59	20.32	6.34	0.2468E 02	0.1056E 01	0.3427E 01	0.3873E 00	0.7392E 00	0.4438E 00
				4.59	40.64	6.34	0.2468E 02	0.1056E 01	0.3427E 01	0.3873E 00	0.7392E 00	0.4438E 00
				4.59	-40.64	6.34	0.2468E 02	0.1056E 01	0.3427E 01	0.3873E 00	0.7392E 00	0.4438E 00
				4.59	-20.32	6.34	0.1580E 02	0.3891E 01	0.4669E 01	0.2872E 00	0.9077E 00	0.6377E 00



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°UN VFL	ROLL TP	YAW PRNBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
196 10.1	0.0	2 150.0	0.00	0.00	6.34	0.1178E 02	0.2633E 01	0.66849E 00	0.26860E 00	0.5370E 00	0.37631E 00
			0.00	0.00	6.34	0.1005E 02	0.4033E 01	0.10444E 01	0.36941E 00	0.5175E 00	0.69032E 00
			0.00	0.00	6.34	0.1017E 02	0.3826E 01	0.23209E 00	0.26741E 00	0.40237E 00	0.39162E 00
			0.00	0.00	6.34	0.1095E 02	0.3966E 01	0.48602E 00	0.33944E 00	0.33863E 00	0.30637E 00
			0.00	0.00	6.34	0.1150E 02	0.3966E 01	0.48602E 00	0.33944E 00	0.33863E 00	0.30637E 00
			0.00	0.00	6.34	0.1147E 02	0.1114E 01	0.23444E 01	0.25176E 00	0.37071E 00	0.44737E 00
	3 125.0		0.00	0.00	6.34	0.1201E 02	0.4709E 01	0.28453E 01	0.2693E 00	0.11731E 01	0.8519E 00
			0.00	0.00	6.34	0.1245E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
			0.00	0.00	6.34	0.1245E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
			0.00	0.00	6.34	0.1245E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
			0.00	0.00	6.34	0.1245E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
	5 180.0		0.00	0.00	6.34	0.1288E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
			0.00	0.00	6.34	0.1288E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
			0.00	0.00	6.34	0.1288E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
			0.00	0.00	6.34	0.1288E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
			0.00	0.00	6.34	0.1288E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
	5 210.0		0.00	0.00	6.34	0.1288E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
			0.00	0.00	6.34	0.1288E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
			0.00	0.00	6.34	0.1288E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
			0.00	0.00	6.34	0.1288E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
			0.00	0.00	6.34	0.1288E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
	5 240.0		0.00	0.00	6.34	0.1288E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
			0.00	0.00	6.34	0.1288E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
			0.00	0.00	6.34	0.1288E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
			0.00	0.00	6.34	0.1288E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00
			0.00	0.00	6.34	0.1288E 02	0.3776E 01	0.27701E 01	0.2693E 00	0.11731E 01	0.8519E 00

RVMT 242/243 SHIP WAKE TURBULENCE TEST

PUN VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
187 22.5	0.0	2	150.0	1	0.00	-6.60	6.34	0.23185E-02	0.5866E-01	0.17687E-01	0.42335E-00	0.81439E-00	0.54694E-00
				3	0.00	0.00	6.34	0.23192E-02	0.58672E-01	0.17536E-01	0.42390E-00	0.81533E-00	0.54707E-00
				4	0.00	20.32	6.34	0.23160E-02	0.58574E-01	0.17404E-01	0.42368E-00	0.81358E-00	0.54318E-00
				5	0.00	40.64	6.34	0.23171E-02	0.58592E-01	0.17495E-01	0.42375E-00	0.81365E-00	0.54388E-00
				7	0.00	-20.32	6.34	0.23103E-02	0.58330E-01	0.17013E-01	0.42075E-00	0.81071E-00	0.54077E-00
					0.00	-20.32	6.34	0.24411E-02	0.13683E-01	0.47801E-01	0.39505E-00	0.55232E-00	0.47992E-00
3 125.0				1	0.00	0.00	6.34	0.23131E-02	0.45225E-01	0.19308E-01	0.34817E-00	0.97038E-00	0.73658E-00
				3	0.00	0.00	6.34	0.23183E-02	0.44403E-01	0.19088E-01	0.34578E-00	0.95255E-00	0.71794E-00
				4	0.00	20.32	6.34	0.23169E-02	0.45557E-01	0.19443E-01	0.34525E-00	0.95798E-00	0.71561E-00
				5	0.00	40.64	6.34	0.23189E-02	0.45505E-01	0.19544E-01	0.34522E-00	0.95733E-00	0.71505E-00
				7	0.00	-20.32	6.34	0.23158E-02	0.45019E-01	0.19310E-01	0.34516E-00	0.95741E-00	0.71500E-00
					0.00	-20.32	6.34	0.26113E-02	0.49470E-00	0.39666E-01	0.47168E-00	0.84111E-00	0.55581E-00
4 180.0				1	0.00	-6.60	6.34	0.20903E-02	0.80707E-01	0.16685E-00	0.19513E-00	0.59982E-00	0.23358E-00
				3	0.00	0.00	6.34	0.21061E-02	0.80487E-01	0.16788E-00	0.34339E-00	0.98467E-00	0.46741E-00
				4	0.00	20.32	6.34	0.21188E-02	0.81136E-01	0.17130E-00	0.43304E-00	0.11995E-00	0.79101E-00
				5	0.00	40.64	6.34	0.21444E-02	0.82191E-01	0.17398E-00	0.43531E-00	0.11870E-00	0.79101E-00
				7	0.00	-20.32	6.34	0.22275E-02	0.82173E-01	0.17620E-00	0.43550E-00	0.97116E-00	0.46741E-00
					0.00	-20.32	6.34	0.22275E-02	0.82173E-01	0.17620E-00	0.43550E-00	0.97116E-00	0.46741E-00
5 210.0				1	0.00	-6.60	6.34	0.1080E-02	0.78629E-01	0.54995E-01	0.5757E-00	0.5413E-00	0.4802E-00
				3	0.00	0.00	6.34	0.23295E-02	0.8497E-02	0.3097E-01	0.5357E-00	0.86518E-00	0.67330E-00
				4	0.00	20.32	6.34	0.23699E-02	0.8849E-01	0.31332E-00	0.60906E-00	0.15643E-00	0.11444E-00
				5	0.00	40.64	6.34	0.23777E-02	0.8849E-01	0.31332E-00	0.60906E-00	0.15643E-00	0.11444E-00
				7	0.00	-20.32	6.34	0.23715E-02	0.8849E-01	0.31332E-00	0.60906E-00	0.15643E-00	0.11444E-00
					0.00	-20.32	6.34	0.18446E-02	0.8849E-01	0.31332E-00	0.60906E-00	0.15643E-00	0.11444E-00
6 230.0				1	0.00	0.00	6.34	0.5446E-02	0.50895E-01	0.54995E-01	0.41093E-00	0.13050E-00	0.66915E-00
				3	0.00	0.00	6.34	0.5446E-02	0.50895E-01	0.54995E-01	0.41093E-00	0.13050E-00	0.66915E-00
				4	0.00	20.32	6.34	0.5446E-02	0.50895E-01	0.54995E-01	0.41093E-00	0.13050E-00	0.66915E-00
				5	0.00	40.64	6.34	0.5446E-02	0.50895E-01	0.54995E-01	0.41093E-00	0.13050E-00	0.66915E-00
				7	0.00	-20.32	6.34	0.5446E-02	0.50895E-01	0.54995E-01	0.41093E-00	0.13050E-00	0.66915E-00
					0.00	-20.32	6.34	0.5446E-02	0.50895E-01	0.54995E-01	0.41093E-00	0.13050E-00	0.66915E-00

BMVT 242/243 SHIP WAKE TURBULENCE TEST

WUN VEL	ROLL TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
189 10.2	0.0	2 155.0	1	-6.60	6.34	0.1094E 02	0.3410E 01	0.6065E 01	0.4871E 00	0.9682E 00	0.5843E 00
			2	-6.60	6.34	0.1041E 02	0.4125E 01	0.2327E 01	0.4435E 00	0.4435E 00	0.4176E 00
			3	20.32	6.34	0.1017E 02	0.3262E 01	0.2964E 01	0.6843E 00	0.6879E 00	0.6163E 00
			4	20.32	6.34	0.1004E 02	0.3749E 01	0.1630E 00	0.4010E 00	0.1011E 00	0.6904E 00
			5	20.64	6.34	0.1107E 02	0.4799E 01	0.1934E 00	0.2131E 00	0.3871E 00	0.2412E 00
			6	20.64	6.34	0.1108E 02	0.3929E 01	0.3704E 00	0.3836E 00	0.3807E 00	0.7081E 00
			7	-20.32	6.34	0.1126E 02	0.1374E 01	0.1749E 01	0.2204E 00	0.3118E 00	0.2926E 00
	3 180.0		1	-6.60	6.34	0.1148E 02	0.1832E 01	0.1479E 01	0.1130E 01	0.1216E 01	0.9881E 00
			2	-6.60	6.34	0.8008E 02	0.1531E 01	0.2209E 01	0.1486E 01	0.1721E 01	0.1294E 01
			3	20.32	6.34	0.8803E 02	0.1082E 01	0.2038E 01	0.9408E 00	0.1173E 01	0.6161E 00
			4	20.32	6.34	0.1141E 02	0.3392E 01	0.9735E 01	0.2894E 00	0.6227E 00	0.3196E 00
			5	20.64	6.34	0.1173E 02	0.4843E 01	0.1064E 00	0.3922E 00	0.2705E 00	0.2780E 00
			6	20.64	6.34	0.1078E 02	0.4763E 01	0.1411E 00	0.3193E 00	0.5893E 00	0.5180E 00
			7	-20.32	6.34	0.1074E 02	0.1365E 01	0.5376E 00	0.2396E 00	0.2908E 00	0.3557E 00
	4 210.0		1	-6.60	6.34	0.1208E 02	0.4405E 01	0.2505E 01	0.9110E 00	0.5183E 00	0.3690E 00
			2	-6.60	6.34	0.1200E 02	0.4252E 01	0.1823E 01	0.7141E 00	0.3289E 00	0.3682E 00
			3	20.32	6.34	0.1274E 02	0.4175E 01	0.3733E 01	0.4151E 00	0.4011E 00	0.3857E 00
			4	20.32	6.34	0.1234E 02	0.3535E 01	0.3244E 01	0.3224E 00	0.4911E 00	0.2533E 00
			5	20.64	6.34	0.1313E 02	0.4547E 01	0.2340E 01	0.3249E 00	0.2741E 00	0.2533E 00
			6	20.64	6.34	0.1193E 02	0.1754E 01	0.2390E 01	0.3249E 00	0.1106E 00	0.2533E 00
			7	-20.32	6.34	0.8636E 02	0.1754E 01	0.2390E 01	0.3249E 00	0.6174E 00	0.3822E 00

BVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VFL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN	VX	MEAN	VY	MEAN	VZ	S.D.	VX	S.D.	VY	S.D.	VZ
189	22.8	0.0	2	155.0	1	4.57	-6.60	6.34	0.22928E	02	0.602338E	01	-0.95383E	00	0.34666E	00	0.32771E	00	0.52978E	00
					3	4.57	0.00	6.34	0.20891E	02	0.602338E	01	-0.95383E	00	0.34666E	00	0.32771E	00	0.52978E	00
					5	4.57	20.32	6.34	0.15760E	02	0.392284E	01	0.48056E	00	0.42474E	00	0.37993E	00	0.40928E	00
					7	4.57	20.64	6.34	0.20633E	02	0.392284E	01	0.48056E	00	0.42474E	00	0.37993E	00	0.40928E	00
					9	4.57	-20.32	6.34	0.22769E	02	0.392284E	01	0.48056E	00	0.42474E	00	0.37993E	00	0.40928E	00
					1	4.57	-20.64	6.34	0.24143E	02	0.392284E	01	0.48056E	00	0.42474E	00	0.37993E	00	0.40928E	00
					3	4.57	0.00	6.34	0.19197E	02	0.52185E	01	0.45611E	01	0.69488E	00	0.32259E	00	0.53213E	00
					5	4.57	20.32	6.34	0.17585E	02	0.52185E	01	0.45611E	01	0.69488E	00	0.32259E	00	0.53213E	00
					7	4.57	20.64	6.34	0.18660E	02	0.52185E	01	0.45611E	01	0.69488E	00	0.32259E	00	0.53213E	00
					9	4.57	-20.32	6.34	0.23951E	02	0.26716E	01	0.39924E	00	0.17574E	00	0.37993E	00	0.40928E	00
					1	4.57	-20.64	6.34	0.24766E	02	0.26716E	01	0.39924E	00	0.17574E	00	0.37993E	00	0.40928E	00
					3	4.57	0.00	6.34	0.22812E	02	0.22239E	01	-0.23354E	00	0.34623E	00	0.37993E	00	0.40928E	00
					5	4.57	20.32	6.34	0.20803E	02	0.22239E	01	-0.23354E	00	0.34623E	00	0.37993E	00	0.40928E	00
					7	4.57	20.64	6.34	0.24766E	02	0.22239E	01	-0.23354E	00	0.34623E	00	0.37993E	00	0.40928E	00
					9	4.57	-20.32	6.34	0.23223E	02	0.22239E	01	-0.23354E	00	0.34623E	00	0.37993E	00	0.40928E	00
					1	4.57	-20.64	6.34	0.17541E	02	0.22239E	01	-0.23354E	00	0.34623E	00	0.37993E	00	0.40928E	00

RVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL	TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
190 10.4	15.0	2	150.0	1	0.00	6.60	0.1590E 02	0.27359E 01	0.71139E 01	0.30510E 00	0.2479E 00	0.3381E 00
				2	0.00	6.34	0.11250E 02	0.41955E 01	0.23017E 01	0.4443E 00	0.2497E 00	0.3136E 00
				3	0.00	6.34	0.10162E 02	0.01687E 01	0.20957E 01	0.02209E 00	0.01194E 01	0.07030E 00
				4	0.00	6.34	0.10481E 02	0.16872E 01	0.24210E 01	0.04909E 00	0.11945E 01	0.17006E 00
				5	0.00	6.34	0.11233E 02	0.01432E 01	0.11945E 01	0.03816E 00	0.0960E 00	0.04780E 00
				6	0.00	6.34	0.11614E 02	0.01390E 01	0.22186E 01	0.03119E 00	0.28233E 00	0.26109E 00
	3	120.0		1	0.00	6.60	0.12311E 02	0.5118E 01	0.2163E 01	0.5976E 00	0.9264E 00	0.5720E 00
				2	0.00	6.60	0.11111E 02	0.32679E 01	0.23281E 01	0.10978E 00	0.0594E 00	0.04318E 00
				3	0.00	6.34	0.09622E 02	0.01432E 01	0.39358E 01	0.04360E 00	0.07490E 00	0.05211E 00
				4	0.00	6.34	0.13029E 02	0.01432E 01	0.25749E 01	0.03991E 00	0.09772E 00	0.05372E 00
				5	0.00	6.34	0.13229E 02	0.01432E 01	0.15613E 01	0.02687E 00	0.05171E 00	0.03721E 00
	4	180.0		1	0.00	6.60	0.98993E 02	0.5771E 01	0.23740E 01	0.1196E 00	0.3939E 00	0.3039E 00
				2	0.00	6.60	0.10233E 02	0.01432E 01	0.23017E 01	0.0443E 00	0.3330E 00	0.07030E 00
				3	0.00	6.34	0.10233E 02	0.01432E 01	0.23017E 01	0.0443E 00	0.3330E 00	0.07030E 00
				4	0.00	6.34	0.10233E 02	0.01432E 01	0.23017E 01	0.0443E 00	0.3330E 00	0.07030E 00
				5	0.00	6.34	0.10233E 02	0.01432E 01	0.23017E 01	0.0443E 00	0.3330E 00	0.07030E 00
	5	210.0		1	0.00	6.60	0.3760E 02	0.88915E 01	0.5371E 01	0.3477E 00	0.7170E 00	0.0443E 00
				2	0.00	6.60	0.19062E 02	0.25833E 01	0.6053E 01	0.1411E 00	0.3477E 00	0.0443E 00
				3	0.00	6.34	0.12462E 02	0.01432E 01	0.16872E 01	0.03816E 00	0.11945E 01	0.07030E 00
				4	0.00	6.34	0.12462E 02	0.01432E 01	0.16872E 01	0.03816E 00	0.11945E 01	0.07030E 00
				5	0.00	6.34	0.12462E 02	0.01432E 01	0.16872E 01	0.03816E 00	0.11945E 01	0.07030E 00
				6	0.00	6.34	0.88915E 01	0.02384E 01	0.21190E 01	0.03512E 00	0.4308E 00	0.0443E 00
	6	220.0		1	0.00	6.60	0.1110E 02	0.5118E 01	0.2163E 01	0.10978E 00	0.0594E 00	0.04318E 00
				2	0.00	6.60	0.1166E 02	0.32679E 01	0.23281E 01	0.04360E 00	0.07490E 00	0.05211E 00
				3	0.00	6.34	0.11278E 02	0.01432E 01	0.39358E 01	0.04360E 00	0.07490E 00	0.05211E 00
				4	0.00	6.34	0.11045E 02	0.01432E 01	0.25749E 01	0.03991E 00	0.09772E 00	0.05372E 00
				5	0.00	6.34	0.11045E 02	0.01432E 01	0.15613E 01	0.02687E 00	0.05171E 00	0.03721E 00
				6	0.00	6.34	0.88915E 01	0.02384E 01	0.21190E 01	0.03512E 00	0.4308E 00	0.0443E 00

BVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
191	10.8	15.0	3	150.0	1	23.88	-6.60	6.34	0.10280E 02	0.22746E 01	0.17318E 01	0.2784E 00	0.6747E 00	0.59892E 00
					2	23.88	0.00	6.34	0.0999E 02	0.0660E 01	0.15973E 00	0.2764E 00	0.0948E 00	0.59892E 00
					3	23.88	0.50	6.34	0.1057E 02	0.05013E 01	0.09400E 00	0.4331E 00	0.0948E 00	0.59892E 00
					4	23.88	20.32	6.34	0.1057E 02	0.14397E 01	0.09400E 00	0.4331E 00	0.0948E 00	0.59892E 00
					5	23.88	40.64	6.34	0.1057E 02	0.28916E 01	0.13945E 01	0.2764E 00	0.0948E 00	0.59892E 00
					6	23.88	-20.32	6.34	0.11430E 02	0.11941E 01	0.12641E 01	0.12972E 00	0.0948E 00	0.59892E 00
					7	23.88	-20.32	6.34	0.11430E 02	0.11941E 01	0.12641E 01	0.12972E 00	0.0948E 00	0.59892E 00
					1	23.88	-6.60	6.34	0.11685E 01	0.23933E 01	0.2925E 01	0.31264E 00	0.1084E 00	0.2925E 01
					2	23.88	0.00	6.34	0.11685E 01	0.23933E 01	0.2925E 01	0.31264E 00	0.1084E 00	0.2925E 01
					3	23.88	0.00	6.34	0.11685E 01	0.23933E 01	0.2925E 01	0.31264E 00	0.1084E 00	0.2925E 01
					4	23.88	20.32	6.34	0.12003E 01	0.10419E 01	0.23933E 01	0.31264E 00	0.1084E 00	0.2925E 01
					5	23.88	40.64	6.34	0.12003E 01	0.10419E 01	0.23933E 01	0.31264E 00	0.1084E 00	0.2925E 01
					6	23.88	-20.32	6.34	0.12003E 01	0.10419E 01	0.23933E 01	0.31264E 00	0.1084E 00	0.2925E 01
					7	23.88	-20.32	6.34	0.12003E 01	0.10419E 01	0.23933E 01	0.31264E 00	0.1084E 00	0.2925E 01
					1	23.88	-6.60	6.34	0.10604E 02	0.58585E 00	0.46984E 00	0.36004E 00	0.08251E 00	0.5616E 00
					2	23.88	0.00	6.34	0.10604E 02	0.58585E 00	0.46984E 00	0.36004E 00	0.08251E 00	0.5616E 00
					3	23.88	0.00	6.34	0.10604E 02	0.58585E 00	0.46984E 00	0.36004E 00	0.08251E 00	0.5616E 00
					4	23.88	20.32	6.34	0.10604E 02	0.58585E 00	0.46984E 00	0.36004E 00	0.08251E 00	0.5616E 00
					5	23.88	40.64	6.34	0.10604E 02	0.58585E 00	0.46984E 00	0.36004E 00	0.08251E 00	0.5616E 00
					6	23.88	-20.32	6.34	0.10604E 02	0.58585E 00	0.46984E 00	0.36004E 00	0.08251E 00	0.5616E 00
					7	23.88	-20.32	6.34	0.10604E 02	0.58585E 00	0.46984E 00	0.36004E 00	0.08251E 00	0.5616E 00
					1	23.88	-6.60	6.34	0.1067E 02	0.79457E 00	0.6708E 01	0.35437E 00	0.9346E 00	0.8474E 00
					2	23.88	0.00	6.34	0.1067E 02	0.79457E 00	0.6708E 01	0.35437E 00	0.9346E 00	0.8474E 00
					3	23.88	0.00	6.34	0.1067E 02	0.79457E 00	0.6708E 01	0.35437E 00	0.9346E 00	0.8474E 00
					4	23.88	20.32	6.34	0.1067E 02	0.79457E 00	0.6708E 01	0.35437E 00	0.9346E 00	0.8474E 00
					5	23.88	40.64	6.34	0.1067E 02	0.79457E 00	0.6708E 01	0.35437E 00	0.9346E 00	0.8474E 00
					6	23.88	-20.32	6.34	0.1067E 02	0.79457E 00	0.6708E 01	0.35437E 00	0.9346E 00	0.8474E 00
					7	23.88	-20.32	6.34	0.1067E 02	0.79457E 00	0.6708E 01	0.35437E 00	0.9346E 00	0.8474E 00
					1	23.88	-6.60	6.34	0.09476E 01	0.46371E 01	0.14341E 01	0.25319E 00	0.36661E 00	0.19863E 00
					2	23.88	0.00	6.34	0.09476E 01	0.46371E 01	0.14341E 01	0.25319E 00	0.36661E 00	0.19863E 00
					3	23.88	0.00	6.34	0.09476E 01	0.46371E 01	0.14341E 01	0.25319E 00	0.36661E 00	0.19863E 00
					4	23.88	20.32	6.34	0.09476E 01	0.46371E 01	0.14341E 01	0.25319E 00	0.36661E 00	0.19863E 00
					5	23.88	40.64	6.34	0.09476E 01	0.46371E 01	0.14341E 01	0.25319E 00	0.36661E 00	0.19863E 00
					6	23.88	-20.32	6.34	0.09476E 01	0.46371E 01	0.14341E 01	0.25319E 00	0.36661E 00	0.19863E 00
					7	23.88	-20.32	6.34	0.09476E 01	0.46371E 01	0.14341E 01	0.25319E 00	0.36661E 00	0.19863E 00
					1	23.88	-6.60	6.34	0.08766E 01	0.32753E 01	0.24032E 01	0.24733E 00	0.36510E 00	0.32503E 00
					2	23.88	0.00	6.34	0.08766E 01	0.32753E 01	0.24032E 01	0.24733E 00	0.36510E 00	0.32503E 00
					3	23.88	0.00	6.34	0.08766E 01	0.32753E 01	0.24032E 01	0.24733E 00	0.36510E 00	0.32503E 00
					4	23.88	20.32	6.34	0.08766E 01	0.32753E 01	0.24032E 01	0.24733E 00	0.36510E 00	0.32503E 00
					5	23.88	40.64	6.34	0.08766E 01	0.32753E 01	0.24032E 01	0.24733E 00	0.36510E 00	0.32503E 00
					6	23.88	-20.32	6.34	0.08766E 01	0.32753E 01	0.24032E 01	0.24733E 00	0.36510E 00	0.32503E 00
					7	23.88	-20.32	6.34	0.08766E 01	0.32753E 01	0.24032E 01	0.24733E 00	0.36510E 00	0.32503E 00

BUWT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
19 10.4	15.0	2	150.0	1	43.16	-6.60	6.34	0.10159E 02	0.68476E 01	0.14643E 00	0.24951E 00	0.62047E 00	0.33935E 00
				2	43.16	0.00	6.34	0.10725E 01	-0.10547E 01	0.26740E 00	0.26915E 00	0.59278E 00	0.35244E 00
				3	43.16	20.32	6.34	0.09910E 02	-0.11765E 01	0.19931E 00	0.25035E 00	0.65989E 00	0.35244E 00
				4	43.16	20.64	6.34	0.10561E 02	-0.10493E 01	0.86641E 00	0.24469E 00	0.38977E 00	0.57289E 00
				5	43.16	-20.64	6.34	0.11059E 02	-0.14041E 01	-0.24773E 00	0.30332E 00	0.28729E 00	0.11877E 00
				6	43.16	-20.32	6.34	0.10494E 02	-0.13766E 01	0.46512E 00	0.21138E 00	0.30148E 00	0.26710E 00
	3	120.0		1	43.16	-6.60	6.34	0.25513E 01	0.28027E 00	0.57950E 00	0.29140E 00	0.80739E 00	0.60338E 00
				2	43.16	0.00	6.34	0.10111E 02	-0.83242E 01	0.73866E 00	0.30198E 00	0.69476E 00	0.51233E 00
				3	43.16	6.60	6.34	0.92741E 01	-0.15153E 00	0.10966E 01	0.31744E 00	0.10668E 01	0.58466E 00
				4	43.16	20.32	6.34	0.10028E 02	-0.84233E 00	0.57376E 00	0.31802E 00	0.12028E 00	0.52566E 00
				5	43.16	20.64	6.34	0.10487E 02	-0.24236E 00	0.42903E 00	0.39105E 00	0.55244E 00	0.38206E 00
				6	43.16	-20.64	6.34	0.11197E 01	-0.46679E 01	0.12948E 01	0.37177E 00	0.30338E 01	0.99300E 01
				7	43.16	-20.32	6.34	0.99433E 01	-0.11263E 01	0.61871E 01	0.13671E 00	0.27386E 00	0.25806E 00
	4	180.0		1	43.16	-6.60	6.34	0.10455E 02	0.35621E 00	0.90379E 00	0.29666E 00	0.10018E 01	0.54231E 00
				2	43.16	0.00	6.34	0.11185E 01	-0.31091E 00	0.22912E 01	0.44220E 00	0.11232E 01	0.53552E 00
				3	43.16	6.60	6.34	0.10160E 02	-0.18094E 00	0.13719E 01	0.33598E 00	0.57887E 00	0.70022E 00
				4	43.16	20.32	6.34	0.11193E 02	-0.16091E 00	0.11928E 01	0.33598E 00	0.57887E 00	0.70022E 00
				5	43.16	20.64	6.34	0.10733E 02	-0.16091E 00	0.11928E 01	0.33598E 00	0.57887E 00	0.70022E 00
				6	43.16	-20.64	6.34	0.10603E 02	-0.16091E 00	0.11928E 01	0.33598E 00	0.57887E 00	0.70022E 00
				7	43.16	-20.32	6.34	0.10603E 02	-0.16091E 00	0.11928E 01	0.33598E 00	0.57887E 00	0.70022E 00
	5	210.0		1	43.16	-6.60	6.34	0.99933E 01	0.33011E 00	0.30599E 00	0.33844E 00	0.77042E 00	0.55309E 00
				2	43.16	0.00	6.34	0.10725E 01	-0.14229E 01	0.31109E 00	0.33399E 00	0.10410E 01	0.86466E 00
				3	43.16	6.60	6.34	0.10103E 02	-0.20014E 01	0.33449E 00	0.30466E 00	0.65588E 00	0.74666E 00
				4	43.16	20.32	6.34	0.11098E 02	-0.18666E 01	0.33449E 00	0.30466E 00	0.65588E 00	0.74666E 00
				5	43.16	20.64	6.34	0.11988E 02	-0.14229E 01	0.33449E 00	0.30466E 00	0.65588E 00	0.74666E 00
				6	43.16	-20.64	6.34	0.10522E 01	-0.47769E 01	0.13299E 01	0.39615E 00	0.38777E 00	0.25597E 00
				7	43.16	-20.32	6.34	0.97715E 01	-0.15695E 01	0.31261E 00	0.29909E 00	0.35923E 00	0.46736E 00
	6	240.0		1	43.16	-6.60	6.34	0.91908E 01	0.57001E 00	0.95621E 00	0.29560E 00	0.36877E 00	0.54123E 00
				2	43.16	0.00	6.34	0.97423E 01	-0.24856E 01	0.12099E 01	0.45191E 00	0.11598E 01	0.54123E 00
				3	43.16	6.60	6.34	0.93330E 02	-0.17776E 01	0.14857E 00	0.32323E 00	0.33294E 00	0.54123E 00
				4	43.16	20.32	6.34	0.10335E 02	-0.17776E 01	0.14857E 00	0.32323E 00	0.33294E 00	0.54123E 00
				5	43.16	20.64	6.34	0.10335E 02	-0.17776E 01	0.14857E 00	0.32323E 00	0.33294E 00	0.54123E 00
				6	43.16	-20.64	6.34	0.10123E 02	-0.17776E 01	0.14857E 00	0.32323E 00	0.33294E 00	0.54123E 00
				7	43.16	-20.32	6.34	0.91229E 01	-0.22587E 01	0.16103E 00	0.24185E 00	0.31552E 00	0.54123E 00

## BVWT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN	VX	MEAN	VY	MEAN	VZ	S.D.	VX	S.D.	VY	S.D.	VZ
193	10.3	-15.0	3	150.0	1	43.16	-6.60	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					2	43.16	0.00	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					3	43.16	0.00	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					4	43.16	20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					5	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					6	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					7	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					8	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					9	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					10	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					11	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					12	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					13	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					14	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					15	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					16	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					17	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					18	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					19	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					20	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					21	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					22	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2	0.1082	0.96	0.2
					23	43.16	-20.64	6.34	0.1082	0.96	0.2	0.1082	0.96							





BVNT 242/243 SHIP WAKE TURBULENCE TEST

PUN VFL	ROLL TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
195 10.6	-15.0	2 150.0	1	0.00	6.34	0.1137E 02	0.3247E 01	0.3423E 00	0.4824E 00	0.9907E 00	0.6530E 00
			2	0.00	6.34	0.1117E 02	0.3366E 01	0.1948E 00	0.4017E 00	0.5773E 00	0.6715E 00
			3	0.00	6.34	0.9501E 01	0.1151E 01	0.1272E 00	0.4556E 00	0.1006E 01	0.4914E 00
			4	0.00	6.34	0.1076E 02	0.1767E 01	0.4594E 00	0.2990E 00	0.5189E 00	0.1023E 01
			5	0.00	6.34	0.1131E 02	0.3542E 01	0.5713E 01	0.3160E 00	0.7308E 00	0.3907E 00
			6	0.00	6.34	0.1156E 02	0.8229E 00	0.2656E 01	0.3088E 00	0.3400E 00	0.4064E 00
			7	0.00	6.34	0.1090E 02	0.3990E 01	0.1845E 00	0.6649E 00	0.9728E 00	0.6761E 00
	3 120.0		1	0.00	6.34	0.1078E 02	0.3303E 01	0.3351E 00	0.1947E 00	0.1822E 01	0.1081E 00
			2	0.00	6.34	0.1078E 02	0.3303E 01	0.3351E 00	0.1947E 00	0.1822E 01	0.1081E 00
			3	0.00	6.34	0.1078E 02	0.3303E 01	0.3351E 00	0.1947E 00	0.1822E 01	0.1081E 00
			4	0.00	6.34	0.1078E 02	0.3303E 01	0.3351E 00	0.1947E 00	0.1822E 01	0.1081E 00
			5	0.00	6.34	0.1078E 02	0.3303E 01	0.3351E 00	0.1947E 00	0.1822E 01	0.1081E 00
			6	0.00	6.34	0.1078E 02	0.3303E 01	0.3351E 00	0.1947E 00	0.1822E 01	0.1081E 00
			7	0.00	6.34	0.1078E 02	0.3303E 01	0.3351E 00	0.1947E 00	0.1822E 01	0.1081E 00
	4 180.0		1	0.00	6.34	0.1018E 02	0.5120E 00	0.4314E 00	0.3670E 01	0.9420E 00	0.6198E 00
			2	0.00	6.34	0.1002E 02	0.4956E 01	0.3638E 00	0.1056E 00	0.1376E 01	0.9734E 00
			3	0.00	6.34	0.9782E 01	0.1135E 01	0.5951E 00	0.5868E 00	0.1050E 01	0.6827E 00
			4	0.00	6.34	0.1124E 02	0.4982E 01	0.1481E 00	0.2772E 00	0.4354E 00	0.5571E 00
			5	0.00	6.34	0.1176E 02	0.1933E 01	0.1213E 00	0.2248E 00	0.2677E 00	0.2035E 00
			6	0.00	6.34	0.1075E 02	0.4837E 01	0.1352E 00	0.1720E 00	0.2983E 00	0.2038E 00
			7	0.00	6.34	0.1075E 02	0.4837E 01	0.1352E 00	0.1720E 00	0.2983E 00	0.2038E 00
	5 210.0		1	0.00	6.34	0.1037E 02	0.4059E 01	0.2351E 00	0.1649E 00	0.1719E 00	0.1599E 00
			2	0.00	6.34	0.1109E 02	0.4773E 01	0.1571E 00	0.3891E 00	0.3775E 00	0.3276E 00
			3	0.00	6.34	0.1200E 02	0.1456E 01	0.6815E 00	0.4262E 00	0.9389E 00	0.6452E 00
			4	0.00	6.34	0.1206E 02	0.8046E 01	0.2768E 00	0.2828E 00	0.4645E 00	0.4242E 00
			5	0.00	6.34	0.1083E 02	0.4703E 01	0.1601E 00	0.2656E 00	0.2655E 00	0.2209E 00
			6	0.00	6.34	0.9414E 01	0.2899E 01	0.1901E 00	0.1530E 00	0.1162E 00	0.1371E 00
			7	0.00	6.34	0.9414E 01	0.2899E 01	0.1901E 00	0.1530E 00	0.1162E 00	0.1371E 00
	6 240.0		1	0.00	6.34	0.1471E 02	0.4148E 01	0.3033E 00	0.3956E 00	0.3451E 00	0.2592E 00
			2	0.00	6.34	0.1471E 02	0.4148E 01	0.3033E 00	0.3956E 00	0.3451E 00	0.2592E 00
			3	0.00	6.34	0.1471E 02	0.4148E 01	0.3033E 00	0.3956E 00	0.3451E 00	0.2592E 00
			4	0.00	6.34	0.1471E 02	0.4148E 01	0.3033E 00	0.3956E 00	0.3451E 00	0.2592E 00
			5	0.00	6.34	0.1471E 02	0.4148E 01	0.3033E 00	0.3956E 00	0.3451E 00	0.2592E 00
			6	0.00	6.34	0.1471E 02	0.4148E 01	0.3033E 00	0.3956E 00	0.3451E 00	0.2592E 00
			7	0.00	6.34	0.1471E 02	0.4148E 01	0.3033E 00	0.3956E 00	0.3451E 00	0.2592E 00

SVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VFL	ROLL	TP	YAN	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
196	10.2	-15.0	3	150.0	1	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					3	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					4	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					5	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					7	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					1	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					3	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					4	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					5	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					7	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					1	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					3	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					4	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					5	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					7	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					1	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					3	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					4	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					5	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E
					7	0.00	0.00	1.25	0.141E	0.222E	0.149E	0.209E	0.586E	0.476E





[illegible]

BYMT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VFL	ROLL	TP	YAW	PROF	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
200	11-2	15-0	2	150-0	1	2	00	2	00	00	00	00	00	00
					2	2	00	2	00	00	00	00	00	00
					3	3	00	3	00	00	00	00	00	00
					4	4	00	4	00	00	00	00	00	00
					5	5	00	5	00	00	00	00	00	00
					6	6	00	6	00	00	00	00	00	00
					7	7	00	7	00	00	00	00	00	00
					8	8	00	8	00	00	00	00	00	00
					9	9	00	9	00	00	00	00	00	00
					10	10	00	10	00	00	00	00	00	00
					11	11	00	11	00	00	00	00	00	00
					12	12	00	12	00	00	00	00	00	00
					13	13	00	13	00	00	00	00	00	00
					14	14	00	14	00	00	00	00	00	00
					15	15	00	15	00	00	00	00	00	00
					16	16	00	16	00	00	00	00	00	00
					17	17	00	17	00	00	00	00	00	00
					18	18	00	18	00	00	00	00	00	00
					19	19	00	19	00	00	00	00	00	00
					20	20	00	20	00	00	00	00	00	00
					21	21	00	21	00	00	00	00	00	00
					22	22	00	22	00	00	00	00	00	00
					23	23	00	23	00	00	00	00	00	00
					24	24	00	24	00	00	00	00	00	00
					25	25	00	25	00	00	00	00	00	00
					26	26	00	26	00	00	00	00	00	00
					27	27	00	27	00	00	00	00	00	00
					28	28	00	28	00	00	00	00	00	00
					29	29	00	29	00	00	00	00	00	00
					30	30	00	30	00	00	00	00	00	00
					31	31	00	31	00	00	00	00	00	00
					32	32	00	32	00	00	00	00	00	00
					33	33	00	33	00	00	00	00	00	00
					34	34	00	34	00	00	00	00	00	00
					35	35	00	35	00	00	00	00	00	00
					36	36	00	36	00	00	00	00	00	00
					37	37	00	37	00	00	00	00	00	00
					38	38	00	38	00	00	00	00	00	00
					39	39	00	39	00	00	00	00	00	00
					40	40	00	40	00	00	00	00	00	00
					41	41	00	41	00	00	00	00	00	00
					42	42	00	42	00	00	00	00	00	00
					43	43	00	43	00	00	00	00	00	00
					44	44	00	44	00	00	00	00	00	00
					45	45	00	45	00	00	00	00	00	00
					46	46	00	46	00	00	00	00	00	00
					47	47	00	47	00	00	00	00	00	00
					48	48	00	48	00	00	00	00	00	00
					49	49	00	49	00	00	00	00	00	00
					50	50	00	50	00	00	00	00	00	00
					51	51	00	51	00	00	00	00	00	00
					52	52	00	52	00	00	00	00	00	00
					53	53	00	53	00	00	00	00	00	00
					54	54	00	54	00	00	00	00	00	00
					55	55	00	55	00	00	00	00	00	00
					56	56	00	56	00	00	00	00	00	00
					57	57	00	57	00	00	00	00	00	00
					58	58	00	58	00	00	00	00	00	00
					59	59	00	59	00	00	00	00	00	00
					60	60	00	60	00	00	00	00	00	00
					61	61	00	61	00	00	00	00	00	00
					62	62	00	62	00	00	00	00	00	00
					63	63	00	63	00	00	00	00	00	00
					64	64	00	64	00	00	00	00	00	00
					65	65	00	65	00	00	00	00	00	00
					66	66	00	66	00	00	00	00	00	00
					67	67	00	67	00	00	00	00	00	00
					68	68	00	68	00	00	00	00	00	00
					69	69	00	69	00	00	00	00	00	00
					70	70	00	70	00	00	00	00	00	00
					71	71	00	71	00	00	00	00	00	00
					72	72	00	72	00	00	00	00	00	00
					73	73	00	73	00	00	00	00	00	00
					74	74	00	74	00	00	00	00	00	00
					75	75	00	75	00	00	00	00	00	00
					76	76	00	76	00	00	00	00	00	00
					77	77	00	77	00	00	00	00	00	00
					78	78	00	78	00	00	00	00	00	00
					79	79	00	79	00	00	00	00	00	00
					80	80	00	80	00	00	00	00	00	00
					81	81	00	81	00	00	00	00	00	00
					82	82	00	82	00	00	00	00	00	00
					83	83	00	83	00	00	00	00	00	00
					84	84	00	84	00	00	00	00	00	00
					85	85	00	85	00	00	00	00	00	00
					86	86	00	86	00	00	00	00	00	00
					87	87	00	87	00	00	00	00	00	00
					88	88	00	88	00	00	00	00	00	00
					89	89	00	89	00	00	00	00	00	00
					90	90	00	90	00	00	00	00	00	00
					91	91	00	91	00	00	00	00	00	00
					92	92	00	92	00	00	00	00	00	00
					93	93	00	93	00	00	00	00	00	00
					94	94	00	94	00	00	00	00	00	00
					95	95	00	95	00	00	00	00	00	00
					96	96	00	96	00	00	00	00	00	00
					97	97	00	97	00	00	00	00	00	00
					98	98	00	98	00	00	00	00	00	00
					99	99	00	99	00	00	00	00	00	00
					100	100	00	100	00	00	00	00	00	00

8VWT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VFL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN	VX	MEAN	VY	MEAN	VZ	S.D.	VX	S.D.	VY	S.D.	VZ
201	10.7	15.0	2	150.0	1	0.00	-6.60	12.45	0.1011E	02	0.20374E	01	0.28032E	00	0.41114E	00	0.54666E	00	0.47119E	00
					3	0.00	6.60	12.45	0.1192E	02	0.2641E	00	0.62442E	00	0.50639E	00	0.68191E	00	0.58105E	00
					4	0.00	20.32	12.45	0.1097E	02	0.1781E	00	0.12488E	00	0.38774E	00	0.79274E	00	0.52471E	00
					5	0.00	-40.64	12.45	0.12553E	02	0.3281E	00	0.12479E	00	0.4683E	00	0.60469E	00	0.50714E	00
					7	0.00	-20.32	12.45	0.11228E	02	0.34489E	00	0.16531E	01	0.25550E	00	0.38202E	00	0.28279E	00
					3	120.0	0.00	12.45	0.1465E	02	0.3048E	01	0.1820E	00	0.3203E	00	0.7123E	00	0.5371E	00
					4	0.00	6.60	12.45	0.1081E	02	0.33830E	00	0.29468E	00	0.41580E	00	0.49454E	00	0.46224E	00
					5	0.00	20.32	12.45	0.10680E	02	0.32129E	00	0.34677E	00	0.4693E	00	0.6533E	00	0.5399E	00
					6	0.00	-40.64	12.45	0.11837E	02	0.32175E	00	0.22549E	00	0.40287E	00	0.17176E	00	0.5301E	00
					7	0.00	-20.32	12.45	0.12370E	02	0.35224E	00	0.3311E	00	0.31860E	00	0.83578E	00	0.5301E	00
					4	180.0	0.00	12.45	0.1089E	02	0.16558E	00	0.1496E	00	0.29474E	00	0.4984E	00	0.4059E	00
					5	0.00	6.60	12.45	0.1081E	02	0.18742E	00	0.3730E	00	0.31178E	00	0.6533E	00	0.5187E	00
					6	0.00	20.32	12.45	0.1272E	02	0.21530E	00	0.1226E	00	0.3672E	00	0.8233E	00	0.5301E	00
					7	0.00	-40.64	12.45	0.1747E	02	0.27191E	00	0.11337E	00	0.21590E	00	0.44810E	00	0.2194E	00
					5	210.0	0.00	12.45	0.1052E	02	0.13070E	00	0.34099E	00	0.33975E	00	0.4965E	00	0.4550E	00
					6	0.00	6.60	12.45	0.10158E	02	0.39405E	00	0.23336E	00	0.3817E	00	0.4520E	00	0.3209E	00
					7	0.00	20.32	12.45	0.11075E	02	0.46464E	00	0.1784E	00	0.3566E	00	0.7987E	00	0.4505E	00
					8	0.00	-40.64	12.45	0.2094E	02	0.3801E	00	0.37230E	00	0.4366E	00	0.4605E	00	0.5023E	00
					9	0.00	-20.32	12.45	0.10968E	02	0.19945E	00	0.12568E	00	0.3590E	00	0.4905E	00	0.4550E	00
					6	240.0	0.00	12.45	0.08154E	01	0.35025E	00	0.12449E	00	0.28271E	00	0.39389E	00	0.3208E	00
					7	0.00	6.60	12.45	0.1052E	02	0.37857E	00	0.2503E	00	0.25539E	00	0.66100E	00	0.25879E	00
					8	0.00	20.32	12.45	0.10937E	02	0.45848E	00	0.2720E	00	0.3989E	00	0.5782E	00	0.3879E	00
					9	0.00	-40.64	12.45	0.2311E	02	0.38855E	00	0.1558E	00	0.27858E	00	0.24136E	00	0.2337E	00
					6	0.00	-20.32	12.45	0.12281E	02	0.30505E	00	0.15558E	00	0.31885E	00	0.4664E	00	0.30483E	00
					7	0.00	6.60	12.45	0.11691E	02	0.37142E	00	0.2275E	00	0.24687E	00	0.1734E	00	0.1981E	00



**BVVT 242/243 SHIP WAKE TURBULENCE TEST**

PRIN VEL	ROLL TP	YAM PROBF	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
202 10.1	0.0	3	150.0	1	2	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	2	3	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	3	4	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	4	5	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	5	6	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	6	7	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	7	8	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	8	9	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	9	10	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	10	11	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	11	12	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	12	13	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	13	14	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	14	15	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	15	16	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	16	17	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	17	18	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	18	19	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	19	20	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	20	21	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	21	22	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	22	23	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	23	24	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	24	25	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	25	26	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	26	27	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	27	28	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	28	29	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	29	30	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	30	31	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	31	32	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	32	33	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	33	34	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	34	35	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	35	36	0.00	0.00	0.00	0.00	0.00	0.00
202 10.1	0.0	3	150.0	36	37	0.00	0.00	0.00	0.00	0.00	0.00





8VNT 242/243 SHIP WAKE TURBULENCE TEST

PUN VEL	ROLL TP	YAW PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
705 22.7	0.0	2	150.0	0.00	12.45	0.2264E 02	0.1585E 01	0.74907E 00	0.35279E 00	0.7125E 00	0.50672E 00
		3		0.60	12.45	0.23530E 02	0.1380E 00	0.0.11820E 00	0.33739E 00	0.1025E 00	0.6485E 00
		4		20.32	12.45	0.0.23407E 02	0.0.19775E 01	0.0.11820E 00	0.33739E 00	0.1025E 00	0.6485E 00
		5		40.64	12.45	0.0.23526E 02	0.0.2045E 01	0.0.13209E 00	0.33739E 00	0.1025E 00	0.6485E 00
		6		-20.32	12.45	0.0.23309E 02	0.0.3979E 01	0.0.99779E 00	0.33739E 00	0.1025E 00	0.6485E 00
		7		-40.64	12.45	0.0.23746E 02	0.0.14400E 01	0.0.2075E 00	0.33739E 00	0.1025E 00	0.6485E 00
	3	120.0		0.00	12.45	0.2323E 02	0.1291E 00	0.3384E 01	0.4269E 00	0.1023E 01	0.6352E 00
		3		0.60	12.45	0.2323E 02	0.1291E 00	0.3384E 01	0.4269E 00	0.1023E 01	0.6352E 00
		4		20.32	12.45	0.0.19153E 02	0.0.19431E 01	0.0.3547E 00	0.4269E 00	0.1023E 01	0.6352E 00
		5		40.64	12.45	0.0.20490E 02	0.0.19720E 01	0.0.3547E 00	0.4269E 00	0.1023E 01	0.6352E 00
		6		-20.32	12.45	0.0.20911E 02	0.0.29724E 01	0.0.3547E 00	0.4269E 00	0.1023E 01	0.6352E 00
		7		-40.64	12.45	0.0.22694E 02	0.0.10194E 01	0.0.4223E 00	0.4269E 00	0.1023E 01	0.6352E 00
	4	180.0		0.00	12.45	0.2438E 02	0.13519E 00	0.8115E 00	0.2993E 00	0.5744E 00	0.4817E 00
		3		0.60	12.45	0.2438E 02	0.13519E 00	0.8115E 00	0.2993E 00	0.5744E 00	0.4817E 00
		4		20.32	12.45	0.0.23782E 02	0.0.2739E 01	0.0.25507E 00	0.3627E 00	0.8672E 00	0.7118E 00
		5		40.64	12.45	0.0.23255E 02	0.0.17055E 01	0.0.3044E 00	0.3627E 00	0.8672E 00	0.7118E 00
		6		-20.32	12.45	0.0.23487E 02	0.0.2822E 01	0.0.3584E 00	0.3627E 00	0.8672E 00	0.7118E 00
		7		-40.64	12.45	0.0.23841E 02	0.0.8808E 01	0.0.3384E 00	0.3627E 00	0.8672E 00	0.7118E 00
	5	210.0		0.00	12.45	0.23448E 02	0.0.2034E 01	0.1802E 00	0.47843E 00	0.1250E 01	0.6975E 00
		3		0.60	12.45	0.0.23448E 02	0.0.2034E 01	0.1802E 00	0.47843E 00	0.1250E 01	0.6975E 00
		4		20.32	12.45	0.0.23993E 02	0.0.5346E 01	0.0.16550E 00	0.4643E 00	0.1313E 00	0.7957E 00
		5		40.64	12.45	0.0.23516E 02	0.0.3168E 01	0.0.3331E 00	0.4643E 00	0.1313E 00	0.7957E 00
		6		-20.32	12.45	0.0.23577E 02	0.0.3070E 01	0.0.3331E 00	0.4643E 00	0.1313E 00	0.7957E 00
		7		-40.64	12.45	0.0.23577E 02	0.0.3770E 01	0.0.3331E 00	0.4643E 00	0.1313E 00	0.7957E 00
	6	240.0		0.00	12.45	0.2352E 02	0.0.3388E 01	0.4094E 00	0.566E 00	0.1379E 01	0.7765E 00
		3		0.60	12.45	0.2352E 02	0.0.3388E 01	0.4094E 00	0.566E 00	0.1379E 01	0.7765E 00
		4		20.32	12.45	0.0.2357E 02	0.0.5032E 01	0.0.4852E 00	0.566E 00	0.1379E 01	0.7765E 00
		5		40.64	12.45	0.0.2357E 02	0.0.5032E 01	0.0.4852E 00	0.566E 00	0.1379E 01	0.7765E 00
		6		-20.32	12.45	0.0.2357E 02	0.0.5032E 01	0.0.4852E 00	0.566E 00	0.1379E 01	0.7765E 00
		7		-40.64	12.45	0.0.2357E 02	0.0.5032E 01	0.0.4852E 00	0.566E 00	0.1379E 01	0.7765E 00



BMWT 242/243 SHIP WAKE TURBULENCE TEST

RUN	VEL	ROLL	TP	YAM	PROBE	X	Y	Z	MEAN	VX	MEAN	VY	MEAN	VZ	S.D.	VX	S.D.	VY	S.D.	VZ
207	22.6	0.0	2	150.0	1	43.16	-6.60	12.45	0.21521E	02	0.2706E	01	0.4510E	00	0.31671E	00	0.89979E	00	0.58490E	00
					3	43.16	0.00	12.45	0.1977E	02	0.1977E	01	0.3296E	00	0.33072E	00	0.10647E	01	0.59687E	00
					4	43.16	20.32	12.45	0.1732E	02	0.1732E	01	0.0230E	01	0.27427E	00	0.10191E	01	0.55346E	00
					5	43.16	-40.64	12.45	0.0234E	02	0.0234E	01	0.0196E	00	0.27416E	00	0.10156E	01	0.55346E	00
					7	43.16	-20.32	12.54	0.2231E	02	0.2231E	01	0.3501E	00	0.40427E	00	0.98612E	00	0.81713E	00
	3	120.0			1	43.16	-6.60	12.45	0.2044E	02	0.1270E	01	0.8292E	00	0.23873E	00	0.72558E	00	0.41435E	00
					3	43.16	0.00	12.45	0.2009E	02	0.1279E	01	0.0140E	00	0.23980E	00	0.92864E	00	0.42897E	00
					4	43.16	20.32	12.45	0.2125E	02	0.1262E	01	0.8533E	00	0.29218E	00	0.83856E	00	0.43831E	00
					5	43.16	-20.64	12.45	0.2164E	02	0.1262E	01	0.1947E	00	0.26492E	00	0.72389E	00	0.40184E	00
					7	43.16	-20.32	12.54	0.2261E	02	0.0941E	01	0.1874E	01	0.43182E	00	0.93008E	00	0.51865E	00
	4	180.0			1	43.16	-6.60	12.45	0.2141E	02	0.1490E	01	0.6723E	01	0.3756E	00	0.74330E	00	0.51227E	00
					3	43.16	0.00	12.45	0.2310E	02	0.2258E	01	0.6163E	00	0.3517E	00	0.82754E	00	0.56754E	00
					4	43.16	20.32	12.45	0.2388E	02	0.2282E	01	0.3780E	00	0.37308E	00	0.10407E	01	0.55654E	00
					5	43.16	-20.64	12.45	0.2365E	02	0.2140E	01	0.6728E	00	0.31845E	00	0.10738E	01	0.59662E	00
					7	43.16	-20.32	12.54	0.2436E	02	0.2333E	01	0.3066E	00	0.35413E	00	0.61966E	00	0.41175E	00
	5	210.0			1	43.16	-6.60	12.45	0.2254E	02	0.2035E	01	0.1773E	00	0.33910E	00	0.90566E	00	0.47167E	00
					3	43.16	0.00	12.45	0.2147E	02	0.1949E	01	0.3608E	00	0.36597E	01	0.17151E	01	0.52149E	00
					4	43.16	20.32	12.45	0.2377E	02	0.2210E	01	0.5168E	00	0.30326E	00	0.89912E	00	0.51350E	00
					5	43.16	-20.64	12.45	0.2377E	02	0.2210E	01	0.6499E	00	0.3243E	00	0.9637E	00	0.50321E	00
					7	43.16	-20.32	12.54	0.2472E	02	0.2210E	01	0.5974E	00	0.3318E	00	0.10012E	01	0.5788E	00
	6	240.0			1	43.16	-6.60	12.45	0.2033E	02	0.1949E	01	0.1257E	00	0.1976E	00	0.6520E	00	0.3698E	00
					3	43.16	0.00	12.45	0.2190E	02	0.2070E	01	0.2540E	00	0.2970E	00	0.10617E	01	0.59720E	00
					4	43.16	20.32	12.45	0.2207E	02	0.2070E	01	0.2540E	00	0.2970E	00	0.10617E	01	0.59720E	00
					5	43.16	-20.64	12.45	0.2207E	02	0.2070E	01	0.2540E	00	0.2970E	00	0.10617E	01	0.59720E	00
					7	43.16	-20.32	12.54	0.2207E	02	0.2070E	01	0.2540E	00	0.2970E	00	0.10617E	01	0.59720E	00
	7				1	43.16	-6.60	12.45	0.2003E	02	0.1949E	01	0.1257E	00	0.1976E	00	0.6520E	00	0.3698E	00
					3	43.16	0.00	12.45	0.2190E	02	0.2070E	01	0.2540E	00	0.2970E	00	0.10617E	01	0.59720E	00
					4	43.16	20.32	12.45	0.2207E	02	0.2070E	01	0.2540E	00	0.2970E	00	0.10617E	01	0.59720E	00
					5	43.16	-20.64	12.45	0.2207E	02	0.2070E	01	0.2540E	00	0.2970E	00	0.10617E	01	0.59720E	00
					7	43.16	-20.32	12.54	0.2207E	02	0.2070E	01	0.2540E	00	0.2970E	00	0.10617E	01	0.59720E	00

RVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN VFL	ROLL TP	YAW PRDRE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
208 10-1	0-0	2 0-0	0-00	0-60	6-34	0-67101E	0-34814E	0-4266E	0-13297E	0-15276E	0-1731E
			0-00	0-00	6-34	0-61055E	0-32187E	0-4266E	0-10047E	0-17960E	0-10208E
			0-00	0-00	6-34	0-68979E	0-51518E	0-4266E	0-13322E	0-12500E	0-12247E
			0-00	20-32	6-34	0-1168E	0-17859E	0-4266E	0-16092E	0-12542E	0-12247E
			0-00	40-64	6-34	0-1210E	0-26870E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	20-32	6-34	0-1066E	0-44782E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	20-32	6-34	0-1066E	0-27414E	0-4266E	0-17221E	0-12542E	0-12247E
	3 30-0		0-00	0-60	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	0-00	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	0-00	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	20-32	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	40-64	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	20-32	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
	4 50-0		0-00	0-60	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	0-00	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	0-00	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	20-32	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	40-64	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	20-32	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
	5 -30-0		0-00	0-60	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	0-00	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	0-00	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	20-32	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	40-64	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	20-32	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
	6 -50-0		0-00	0-60	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	0-00	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	0-00	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	20-32	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	40-64	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E
			0-00	20-32	6-34	0-1031E	0-2607E	0-4266E	0-17221E	0-12542E	0-12247E

NOTE

The remaining pages in Appendix B present data from the extended 10.4 second runs performed during the airwake test. The mean velocity and standard deviation results were calculated using all 1704 samples taken during the 10.4 second run.

Results presented for the corresponding runs in the main body of Appendix B data were calculated from consideration of 600 samples, rather than for the entire extended 1704 sample run.



SVNT 242/243 SHIP WAKE TURBULENCE TEST

ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
25	22.4	0.0	1	170.69	-6.60	2.22	0.13362E 02	0.12204E 00	0.10054E 01	0.18012E 01	0.24565E 01	0.18858E 01
			2	170.69	0.00	6.222	0.13008E 02	0.12856E 00	0.11894E 00	0.16551E 01	0.24123E 01	0.19045E 01
			3	170.69	6.60	6.222	0.12301E 02	0.12899E 00	0.11894E 00	0.16551E 01	0.24123E 01	0.19045E 01
			4	170.69	20.32	6.222	0.18444E 02	0.12999E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01
			5	170.69	40.64	2.554	0.19822E 02	0.12053E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01
			6	170.69	-6.60	2.554	0.12828E 02	0.12920E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01
			7	170.69	20.32	2.554	0.18066E 02	0.12920E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01
			8	170.69	40.64	2.554	0.18193E 02	0.12920E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01
			9	170.69	-6.60	2.554	0.18193E 02	0.12920E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01
			10	170.69	20.32	2.554	0.18193E 02	0.12920E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01
			11	170.69	40.64	2.554	0.18193E 02	0.12920E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01
			12	170.69	-6.60	2.554	0.18193E 02	0.12920E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01
			13	170.69	20.32	2.554	0.18193E 02	0.12920E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01
			14	170.69	40.64	2.554	0.18193E 02	0.12920E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01
			15	170.69	-6.60	2.554	0.18193E 02	0.12920E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01
			16	170.69	20.32	2.554	0.18193E 02	0.12920E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01
			17	170.69	40.64	2.554	0.18193E 02	0.12920E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01
			18	170.69	-6.60	2.554	0.18193E 02	0.12920E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01
			19	170.69	20.32	2.554	0.18193E 02	0.12920E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01
			20	170.69	40.64	2.554	0.18193E 02	0.12920E 00	0.12320E 00	0.26899E 00	0.29177E 01	0.12771E 01

SVMT 242/243 SHIP WAKE TURBULENCE TEST

RUN VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
51 22.7	0.0	1	0.0	1	0.00	-6.60	18.03	0.18085E 02	-0.10320E 00	-0.13554E 01	0.19933E 01	0.20398E 01	0.18413E 01
				2	0.00	0.00	18.03	0.12321E 02	-0.07335E 00	-0.13678E 00	0.19885E 01	0.20398E 01	0.31100E 01
				3	0.00	6.60	18.03	0.17991E 02	-0.08328E 00	-0.03683E 00	0.20144E 01	0.20398E 01	0.31100E 01
				4	0.00	20.32	18.03	0.16890E 02	-0.07335E 00	-0.03683E 00	0.20144E 01	0.20398E 01	0.31100E 01
				5	0.00	40.64	18.03	0.10829E 02	-0.06100E 00	-0.03683E 00	0.20144E 01	0.20398E 01	0.31100E 01
				7	0.00	-6.60	12.45	0.14577E 02	-0.08131E 01	-0.30384E 00	0.28401E 01	0.28135E 01	0.34400E 01
				9	0.00	20.32	12.45	0.15072E 02	-0.09105E 01	-0.35628E 00	0.10879E 01	0.13470E 01	0.11929E 01
				10	0.00	40.64	12.45	0.19268E 02	-0.25376E 01	-0.74696E 00	0.40284E 00	0.50527E 00	0.43362E 00
				1	0.00	-6.60	18.03	0.20053E 02	-0.40371E 02	-0.45142E 01	0.29135E 00	0.47708E 00	0.34625E 00
				2	0.00	0.00	18.03	0.20884E 02	-0.16716E 01	-0.51908E 01	0.49477E 00	0.50171E 00	0.56971E 00
				3	0.00	6.60	18.03	0.21062E 02	-0.19187E 01	-0.38647E 01	0.52330E 00	0.60347E 00	0.68151E 00
				4	0.00	20.32	18.03	0.15249E 02	-0.16354E 01	-0.85549E 01	0.23955E 01	0.42493E 01	0.42171E 01
				5	0.00	40.64	18.03	0.21108E 02	-0.33277E 01	-0.47722E 01	0.24422E 01	0.38466E 01	0.30198E 01
				6	0.00	-6.60	12.45	0.21211E 02	-0.10949E 00	-0.47955E 01	0.24981E 01	0.48178E 01	0.49552E 01
				7	0.00	20.32	12.45	0.28391E 02	-0.38741E 01	-0.89431E 01	0.32422E 01	0.50171E 01	0.56971E 01
				10	0.00	40.64	12.45	0.15610E 02	-0.14667E 01	-0.50478E 00	0.31275E 01	0.42198E 01	0.32600E 01

# SVMT 242/243 SHIP WAKE TURBULENCE TEST

SWI_VEL	ROLL	TP	YAW	PROBE	X	Y	Z	MEAN VX	MEAN VY	MEAN VZ	S.D. VX	S.D. VY	S.D. VZ
44	22.7	0.0	1	0.0	1	170.69	18.03	0.1627E 02	0.10803E 01	0.12192E 01	0.13003E 01	0.14783E 01	0.11831E 01
					2	170.69	18.03	0.15610E 02	0.15346E 00	0.65510E 00	0.11897E 01	0.14100E 01	0.13681E 01
					3	170.69	18.03	0.18490E 02	0.28619E 00	0.57229E 01	0.11897E 01	0.12994E 01	0.13439E 01
					4	170.69	18.03	0.18717E 02	0.38943E 00	0.17663E 01	0.19320E 00	0.38006E 00	0.39717E 00
					5	170.69	18.03	0.16120E 02	0.38943E 00	0.17663E 01	0.39320E 00	0.38006E 00	0.68081E 00
					6	170.69	18.03	0.16309E 02	0.33402E 00	0.26925E 01	0.15346E 01	0.17895E 01	0.15164E 01
					7	170.69	18.03	0.17863E 02	0.33402E 00	0.11073E 01	0.14371E 01	0.16743E 01	0.17419E 01
					8	170.69	18.03	0.18624E 02	0.29801E 00	0.69086E 00	0.95174E 00	0.84530E 00	0.76384E 00
					9	170.69	18.03		0.51353E -02	0.78671E 00	0.46191E 00	0.54100E 00	0.47332E 00
					10	170.69	18.03						
					1	170.69	18.03	0.16904E 02	0.14893E 01	0.97053E 00	0.21330E 01	0.25011E 01	0.25060E 01
					2	170.69	18.03	0.17343E 02	0.23260E 01	0.21785E 01	0.23342E 01	0.23344E 01	0.28432E 01
					3	170.69	18.03	0.15690E 02	0.41122E 00	0.24805E 01	0.22284E 01	0.21111E 01	0.26471E 01
					4	170.69	18.03	0.18163E 02	0.41122E 00	0.12923E 01	0.12295E 01	0.16765E 01	0.14907E 01
					5	170.69	18.03	0.18476E 02	0.23277E 01	0.31099E 01	0.28038E 00	0.36288E 00	0.51830E 00
					6	170.69	18.03	0.14600E 02	0.23277E 01	0.27945E 01	0.29857E 01	0.33488E 01	0.33450E 01
					7	170.69	18.03	0.14521E 02	0.18999E 00	0.26194E 01	0.26837E 01	0.34315E 01	0.31904E 01
					8	170.69	18.03	0.16661E 02	0.41721E 01	0.29482E 00	0.17354E 01	0.21170E 01	0.16920E 01
					9	170.69	18.03	0.18365E 02	0.41721E 01	0.29482E 00	0.17354E 01	0.21170E 01	0.16920E 01
					10	170.69	18.03		0.11668E 01	0.80555E 00	0.29045E 00	0.47028E 00	0.28284E 00

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INVESTIGATION TO STUDY THE AERODYNAMIC SHIP WAKE TURBULENCE GEN--ETC(U)

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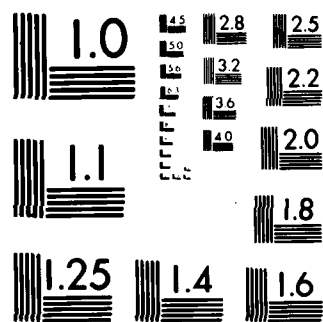
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SVNT 2427253 SHIP WARE TURBULENCE TEST

RUN_VEL	ROLL	IP	YAW	PRD	X	Y	Z	MEAN_VX	MEAN_VY	MEAN_VZ	S.D. VX	S.D. VY	S.D. VZ
% 23.1	0.0	1	0.0		0.00	-6.60	0.03	0.16960E	0.56022E	0.81376E	0.25777E	0.18661E	0.19289E
		2			0.00	0.00	18.003	0.12138E	0.16603E	0.75037E	0.21644E	0.10950E	0.10570E
		3			0.00	20.32	18.003	0.00000E	0.10603E	0.75037E	0.22299E	0.10950E	0.10570E
		4			0.00	-20.64	18.003	0.00000E	0.13445E	0.75037E	0.22299E	0.10950E	0.10570E
		5			0.00	0.00	18.003	0.00000E	0.13445E	0.75037E	0.22299E	0.10950E	0.10570E
		6			0.00	-20.32	18.003	0.00000E	0.13445E	0.75037E	0.22299E	0.10950E	0.10570E
		7			0.00	0.00	18.003	0.00000E	0.13445E	0.75037E	0.22299E	0.10950E	0.10570E
		8			0.00	-20.32	18.003	0.00000E	0.13445E	0.75037E	0.22299E	0.10950E	0.10570E
		9			0.00	0.00	18.003	0.00000E	0.13445E	0.75037E	0.22299E	0.10950E	0.10570E
		10			0.00	-20.32	18.003	0.00000E	0.13445E	0.75037E	0.22299E	0.10950E	0.10570E
								0.19208E	0.86411E	0.43185E	0.22769E	0.36221E	0.22120E
								0.18546E	0.38800E	0.32594E	0.285E	0.2504E	0.2158E
		2	-30.0		0.00	-6.60	18.003	0.00000E	0.38800E	0.32594E	0.285E	0.2504E	0.2158E
		3			0.00	0.00	18.003	0.00000E	0.38800E	0.32594E	0.285E	0.2504E	0.2158E
		4			0.00	20.32	18.003	0.00000E	0.38800E	0.32594E	0.285E	0.2504E	0.2158E
		5			0.00	-20.64	18.003	0.00000E	0.38800E	0.32594E	0.285E	0.2504E	0.2158E
		6			0.00	0.00	18.003	0.00000E	0.38800E	0.32594E	0.285E	0.2504E	0.2158E
		7			0.00	-20.32	18.003	0.00000E	0.38800E	0.32594E	0.285E	0.2504E	0.2158E
		8			0.00	0.00	18.003	0.00000E	0.38800E	0.32594E	0.285E	0.2504E	0.2158E
		9			0.00	-20.32	18.003	0.00000E	0.38800E	0.32594E	0.285E	0.2504E	0.2158E
		10			0.00	-20.32	18.003	0.00000E	0.38800E	0.32594E	0.285E	0.2504E	0.2158E

8001 242/243 SHIP WAKE TURBULENCE TEST

ALIM_VEL	ROLL_IP	YAW_PROBE	X	Y	Z	MEAN_VX	MEAN_VY	MEAN_VZ	S.D. VX	S.D. VY	S.D. VZ
114 22.7	0.0	1	0.0	-6.60	6.22	0.6973E 01	1.3413E 01	0.25093E 00	0.2829E 01	0.3117E 01	0.3696E 01
		2		0.00	6.22	0.19472E 01	0.51370E 01	0.14693E 00	0.28361E 01	0.3122E 01	0.3696E 01
		3		0.00	6.22	0.19472E 01	0.51370E 01	0.14693E 00	0.28361E 01	0.3122E 01	0.3696E 01
		4		-20.32	6.22	0.20324E 02	0.10755E 01	0.025537E 00	0.47601E 00	0.33321E 00	0.3696E 01
		5		-40.66	2.54	0.74775E 01	0.24155E 01	0.14266E 00	0.32368E 01	0.35413E 00	0.3696E 01
		6		-6.60	2.54	0.87499E 01	0.22417E 01	0.110218E 00	0.35440E 01	0.38022E 01	0.3696E 01
		7		-20.32	2.54	0.18963E 02	0.32240E 01	0.30519E 00	0.35440E 01	0.38022E 01	0.3696E 01
		10		-40.66	2.54	0.18963E 02	0.81298E 00	0.64486E 00	0.32514E 01	0.44556E 00	0.49087E 00
	2 -30.0	1	0.0	-6.60	6.22	0.2927E 01	0.2185E 01	0.27035E 00	0.1985E 01	0.27725E 01	0.3666E 01
		2	0.0	0.00	6.22	0.16074E 01	0.51370E 01	0.10270E 00	0.31442E 01	0.3499E 01	0.42662E 01
		3	0.0	0.00	6.22	0.16074E 01	0.51370E 01	0.10270E 00	0.31442E 01	0.3499E 01	0.42662E 01
		4	0.0	-20.32	6.22	0.19700E 01	0.2185E 01	0.04949E 00	0.31442E 01	0.3499E 01	0.42662E 01
		5	0.0	-40.66	6.22	0.19700E 01	0.2185E 01	0.04949E 00	0.31442E 01	0.3499E 01	0.42662E 01
		6	0.0	-6.60	6.22	0.19700E 01	0.2185E 01	0.04949E 00	0.31442E 01	0.3499E 01	0.42662E 01
		7	0.0	-20.32	6.22	0.19700E 01	0.2185E 01	0.04949E 00	0.31442E 01	0.3499E 01	0.42662E 01
		10	0.0	-40.66	6.22	0.19700E 01	0.2185E 01	0.04949E 00	0.31442E 01	0.3499E 01	0.42662E 01

**BVH 242/243 SHIP WAKE TURBULENCE TEST**

[illegible]



OVNI 242/243 SHIP WAKE TURBULENCE TEST

388

[illegible]

UWY 242/243 SHIP WAKE TURBULENCE TEST

[illegible]

#### APPENDIX C

The following pages present additional  
Horizontal Plane - Mean Velocity Component  
Vector Maps derived from the DD 963 Airwake  
Wind Tunnel Test.

APPENDIX C - DD 963 AIRWAKE

Figures C-1 through C-5 depict the flow field at various heights above the landing deck with the ship yawed  $\pm 50^\circ$  or  $\pm 90^\circ$  and at  $0^\circ$  roll angle.

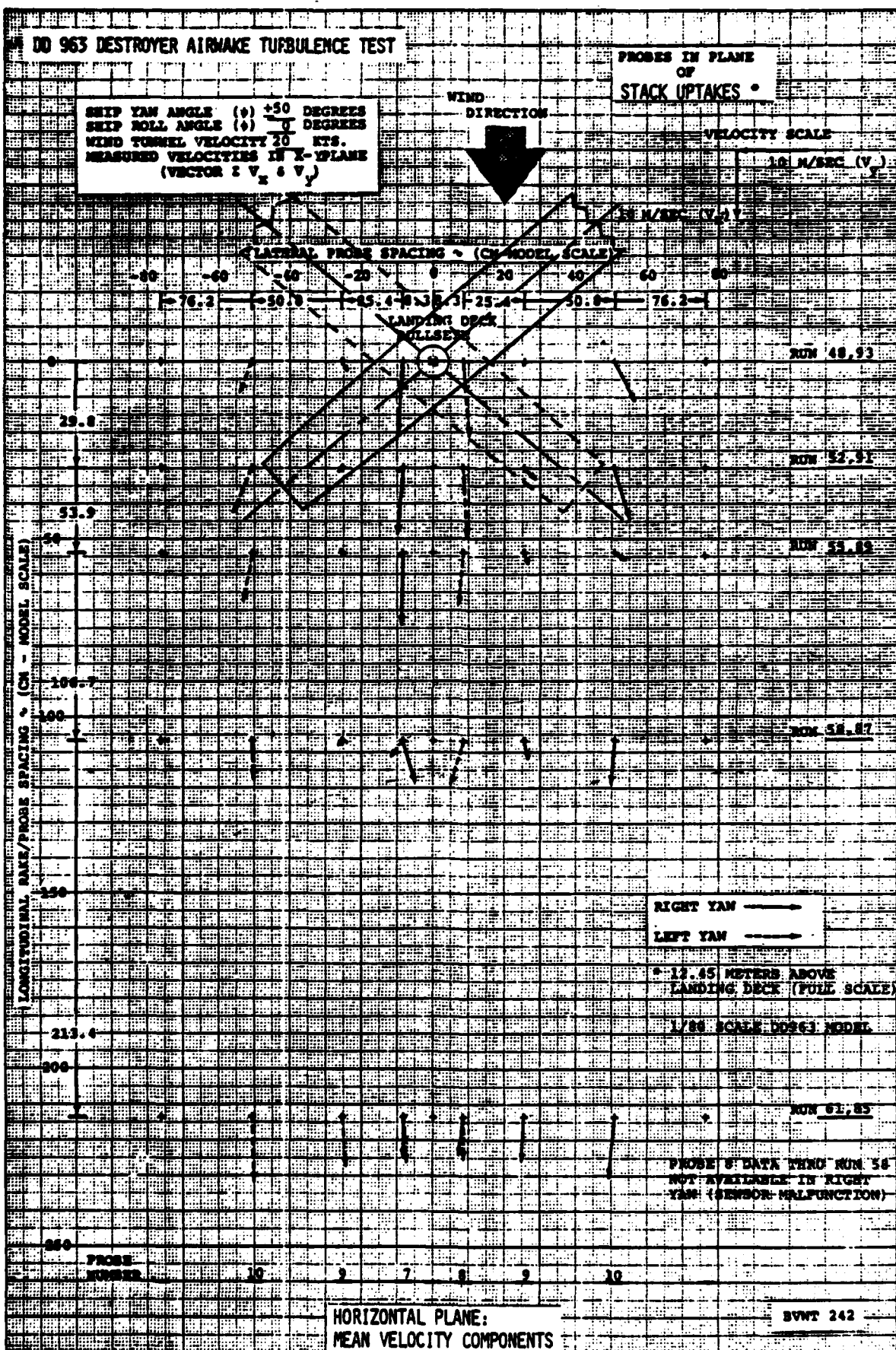


Figure C1.

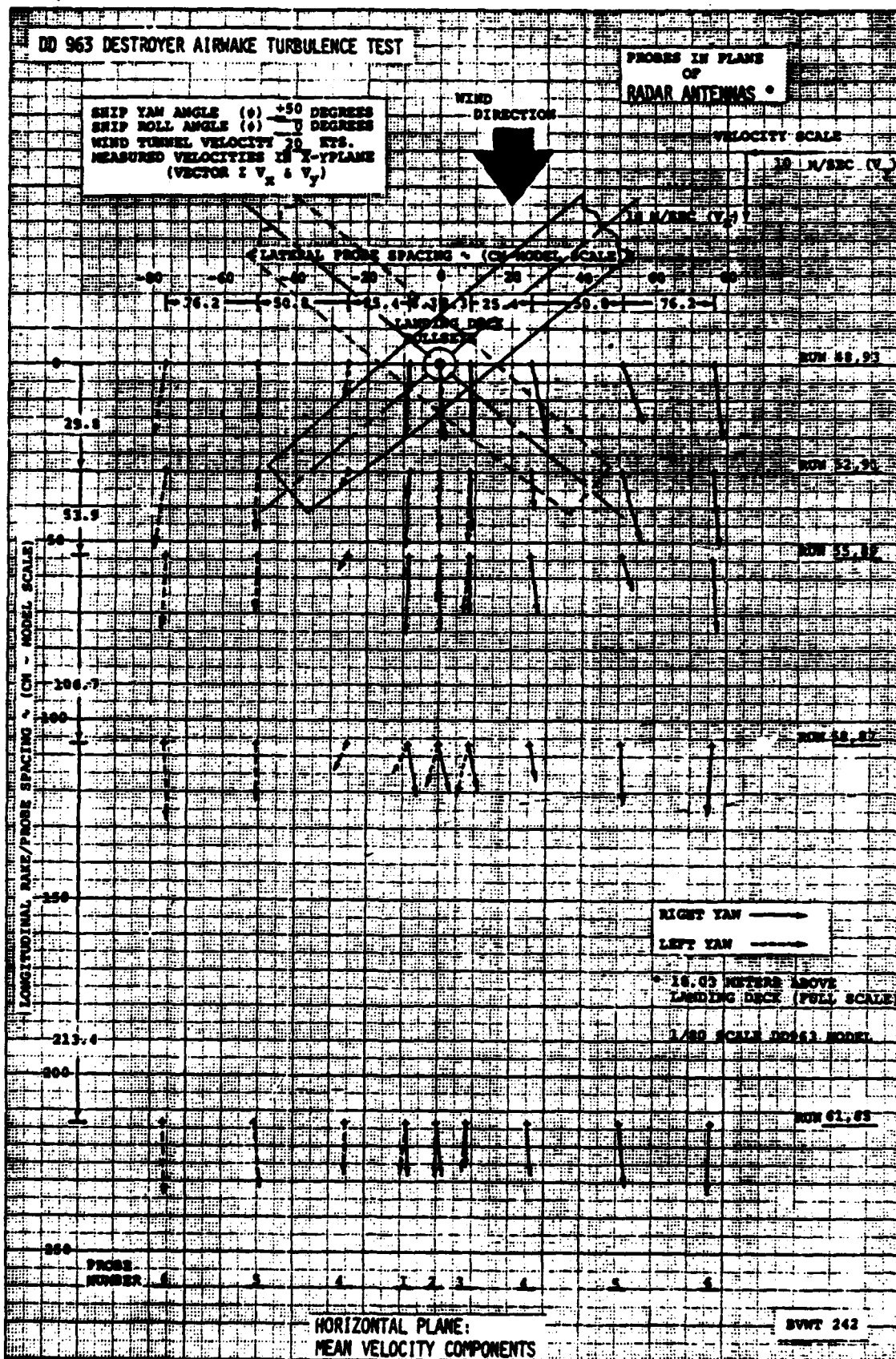


Figure C2.

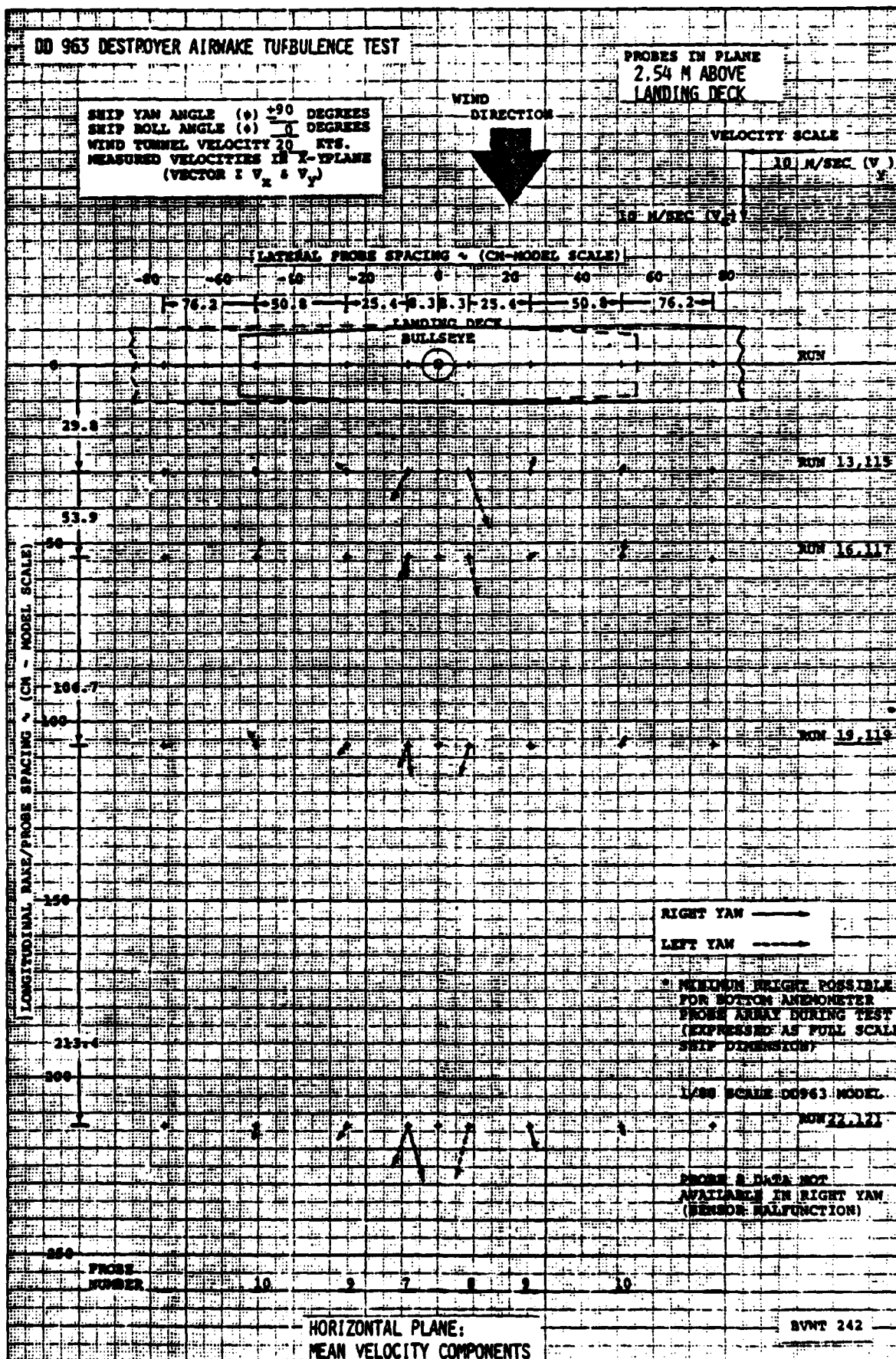


Figure C3.



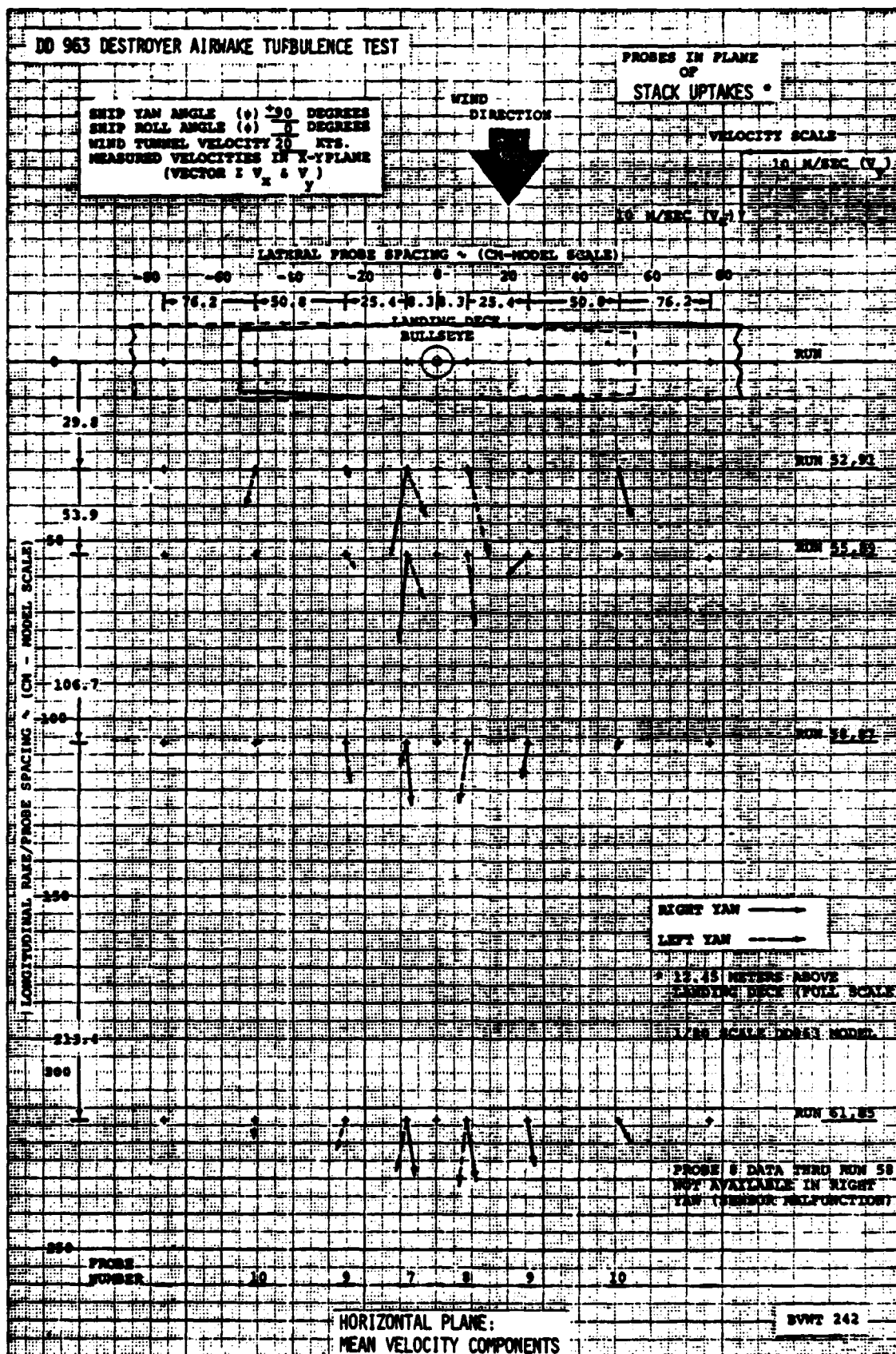


Figure C4.



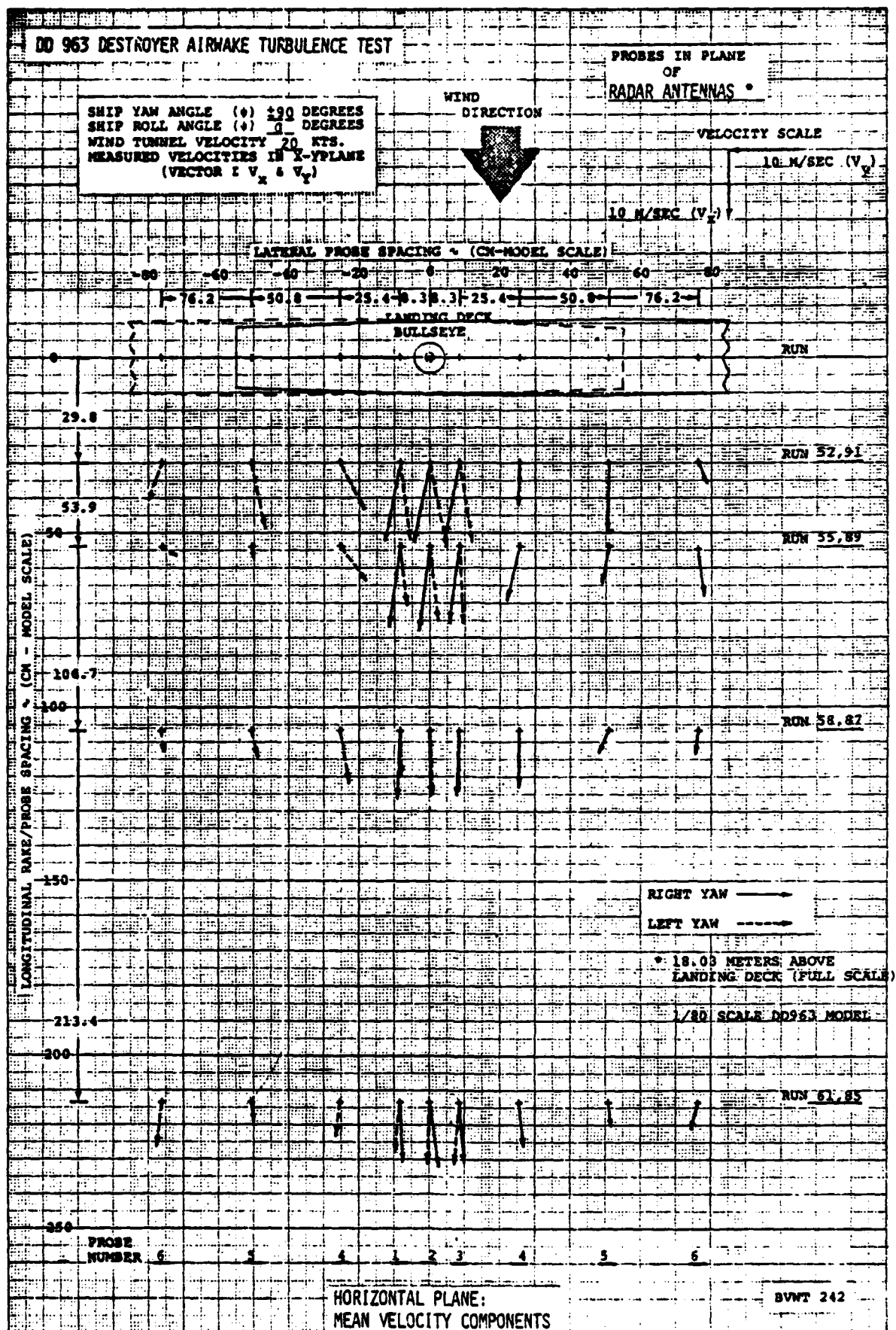


Figure C5.

Figures C-6 through C-14 are useful in analyzing effects of rolling the ship  $15^\circ$  to the right, on the turbulent flow field for various conditions of yaw and height above the deck.

REPRODUCED FROM SLIDE - NOT REPRODUCED

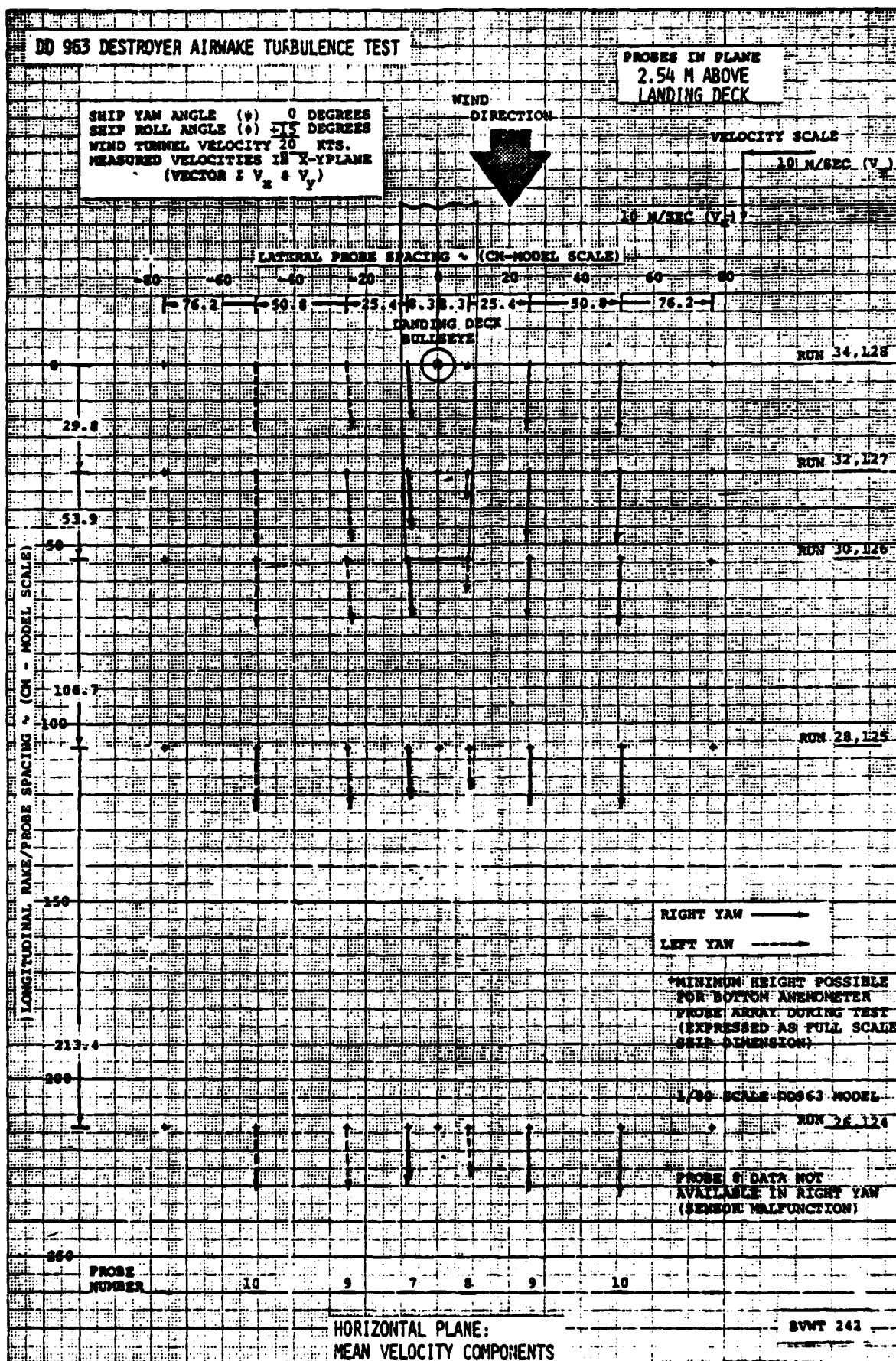


Figure C6.

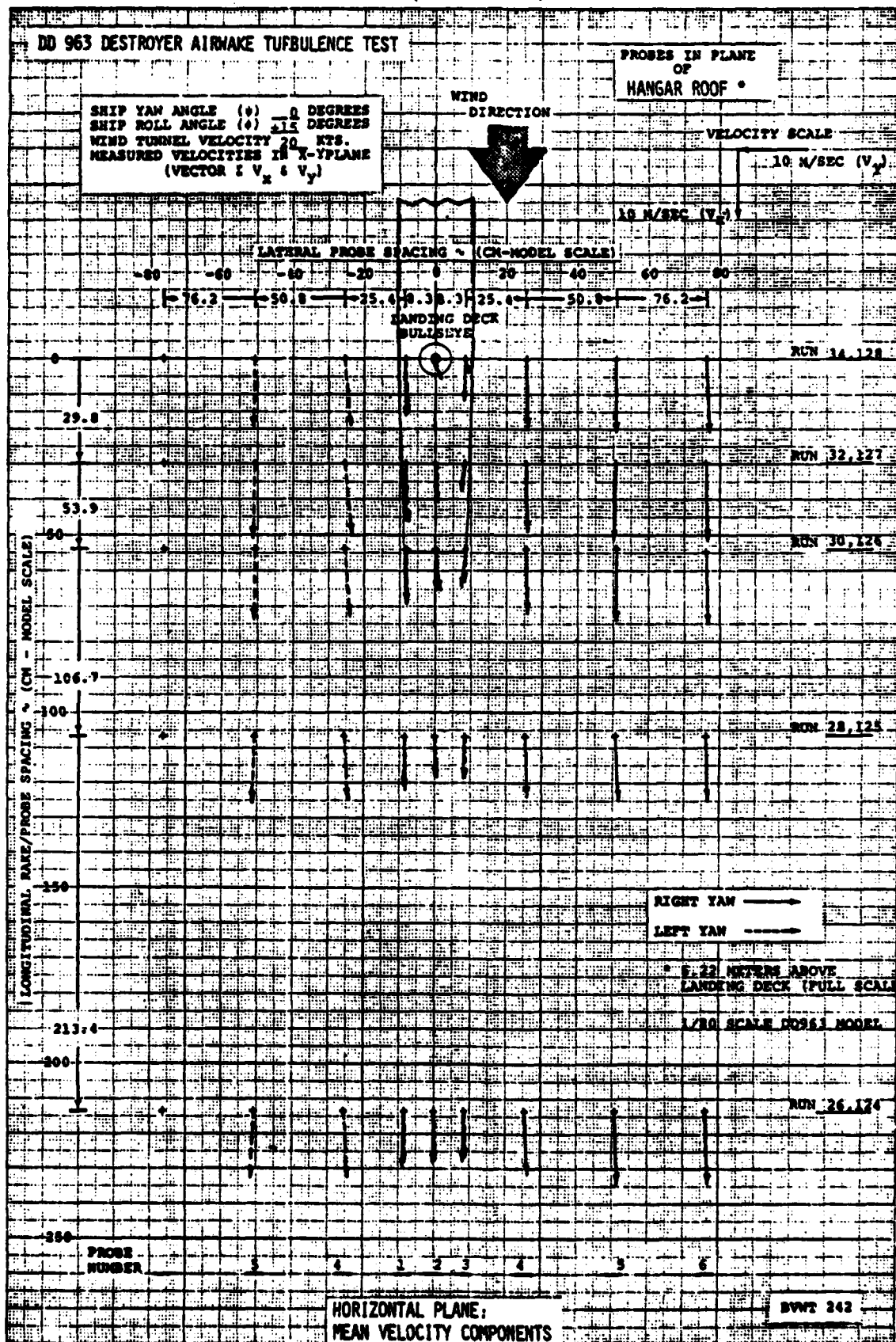


Figure C7.

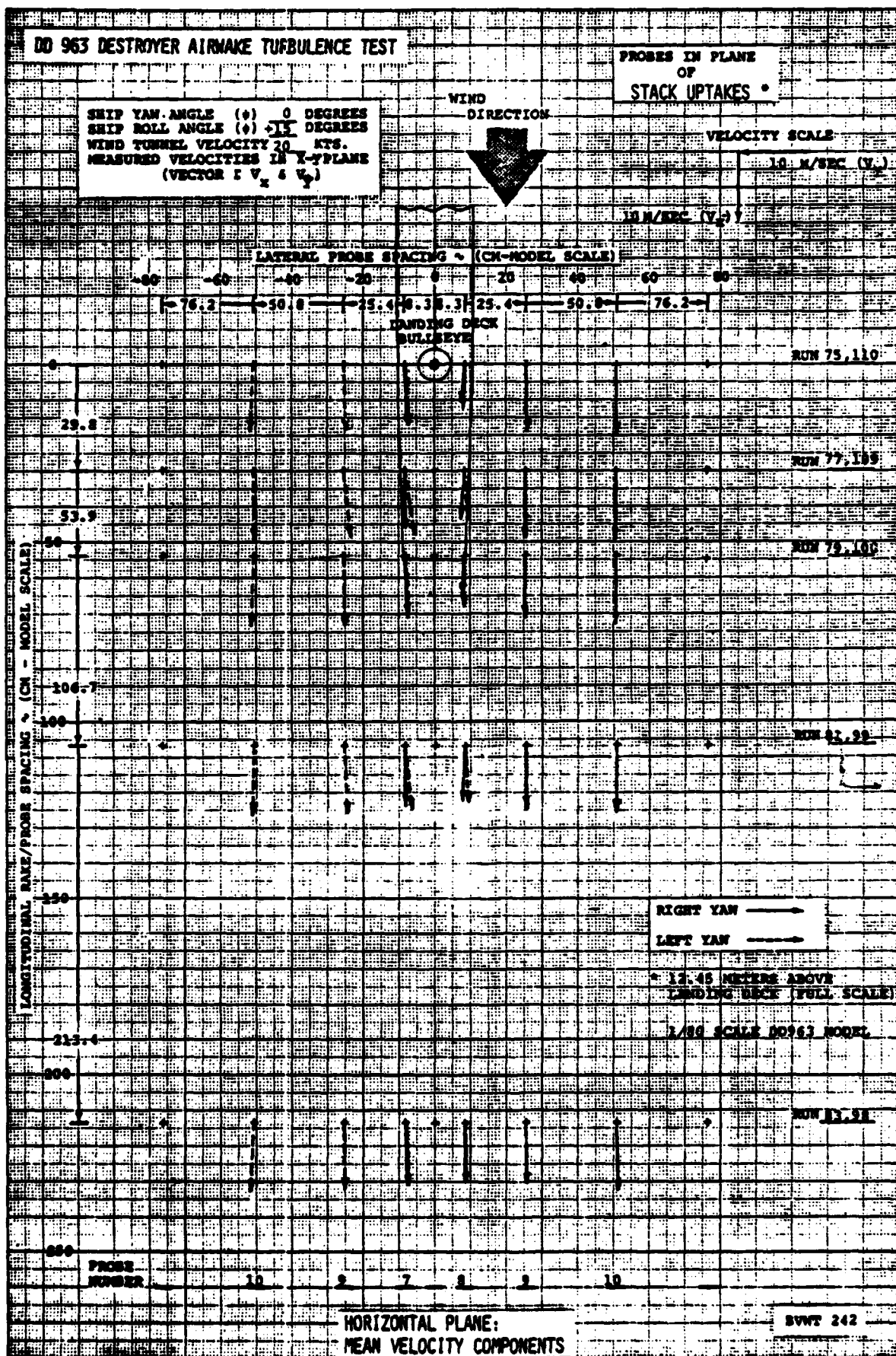


Figure C8.



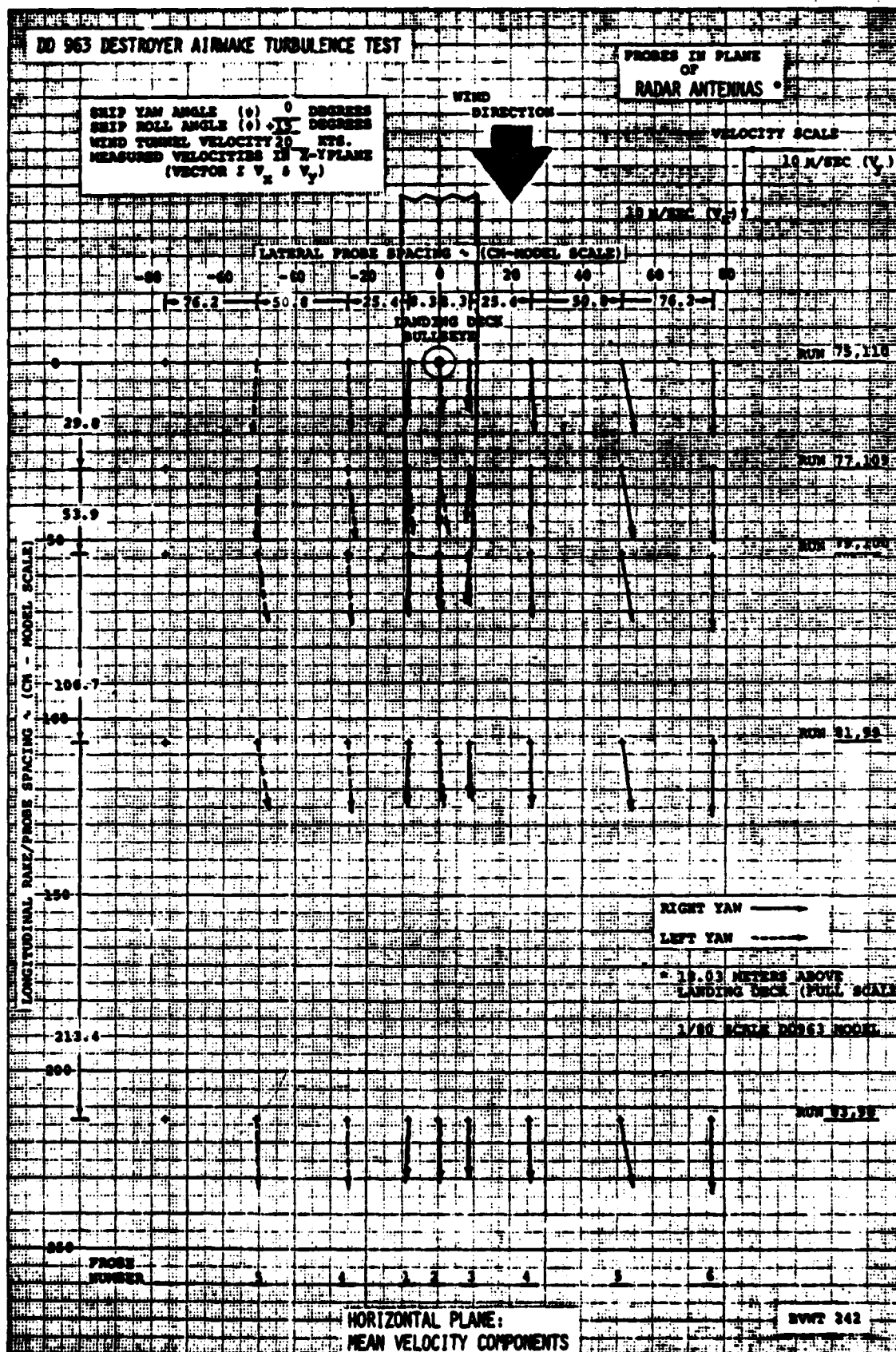


Figure C9.

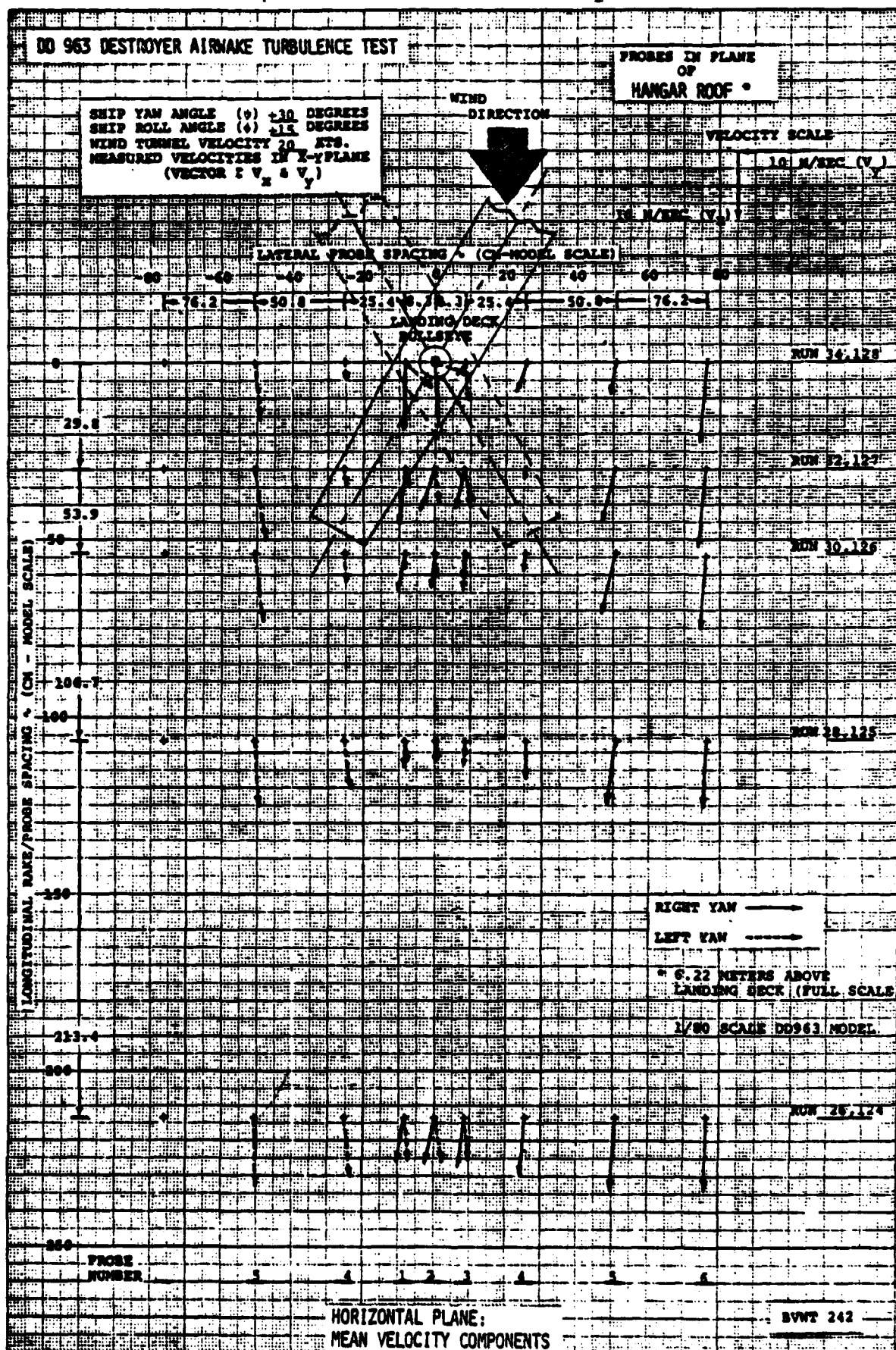


Figure C10.

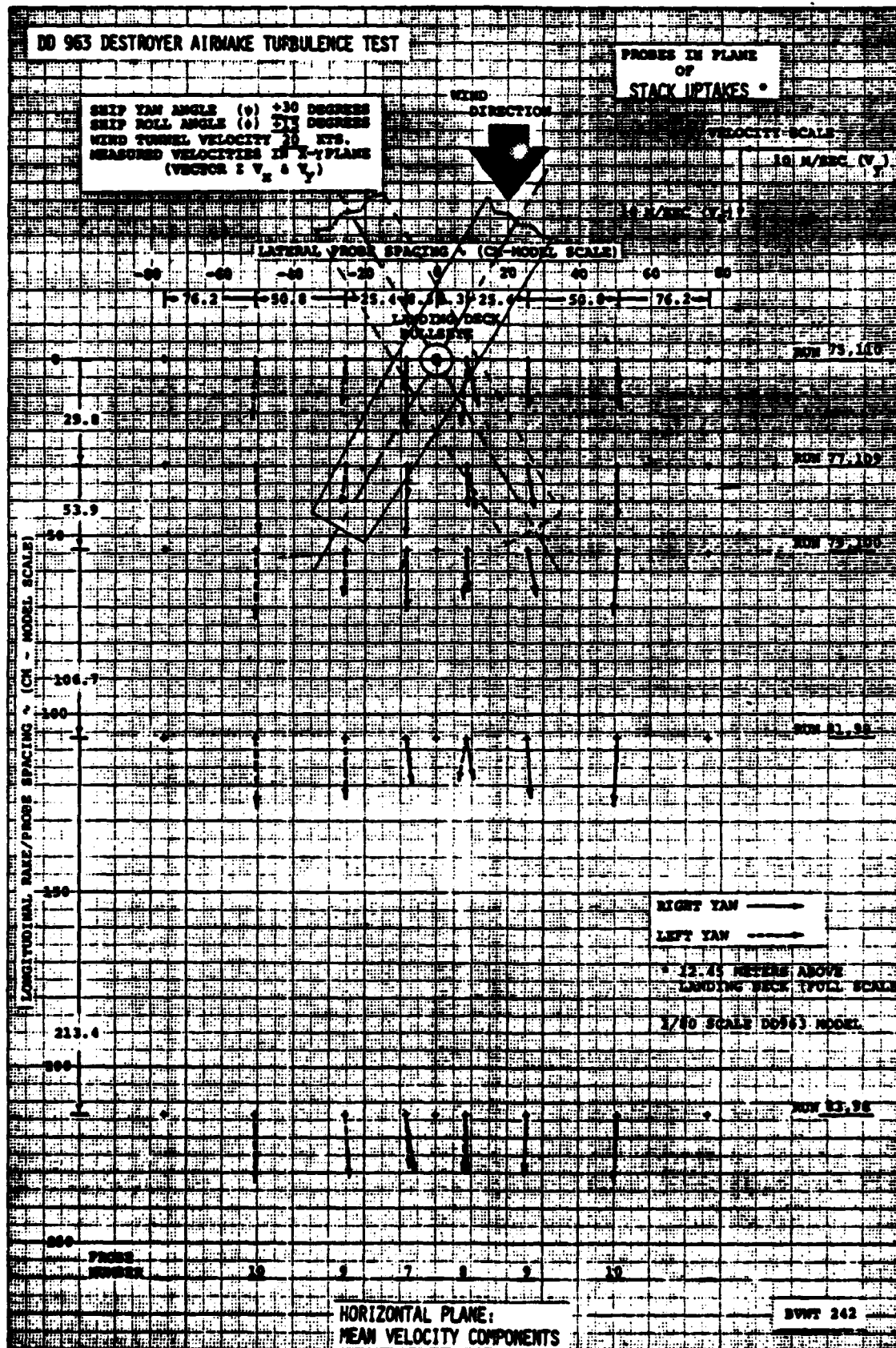


Figure C11.



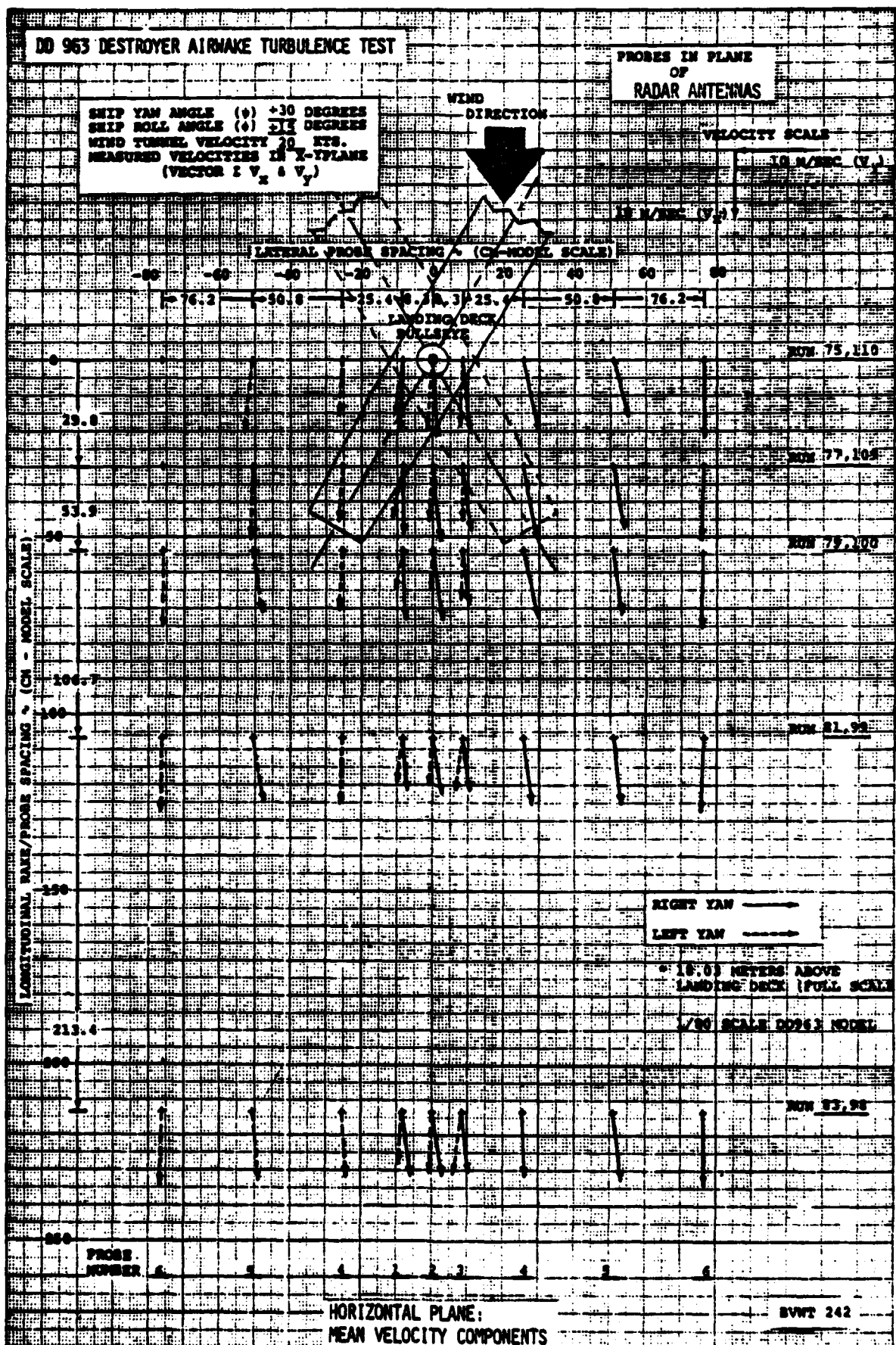


Figure C12.

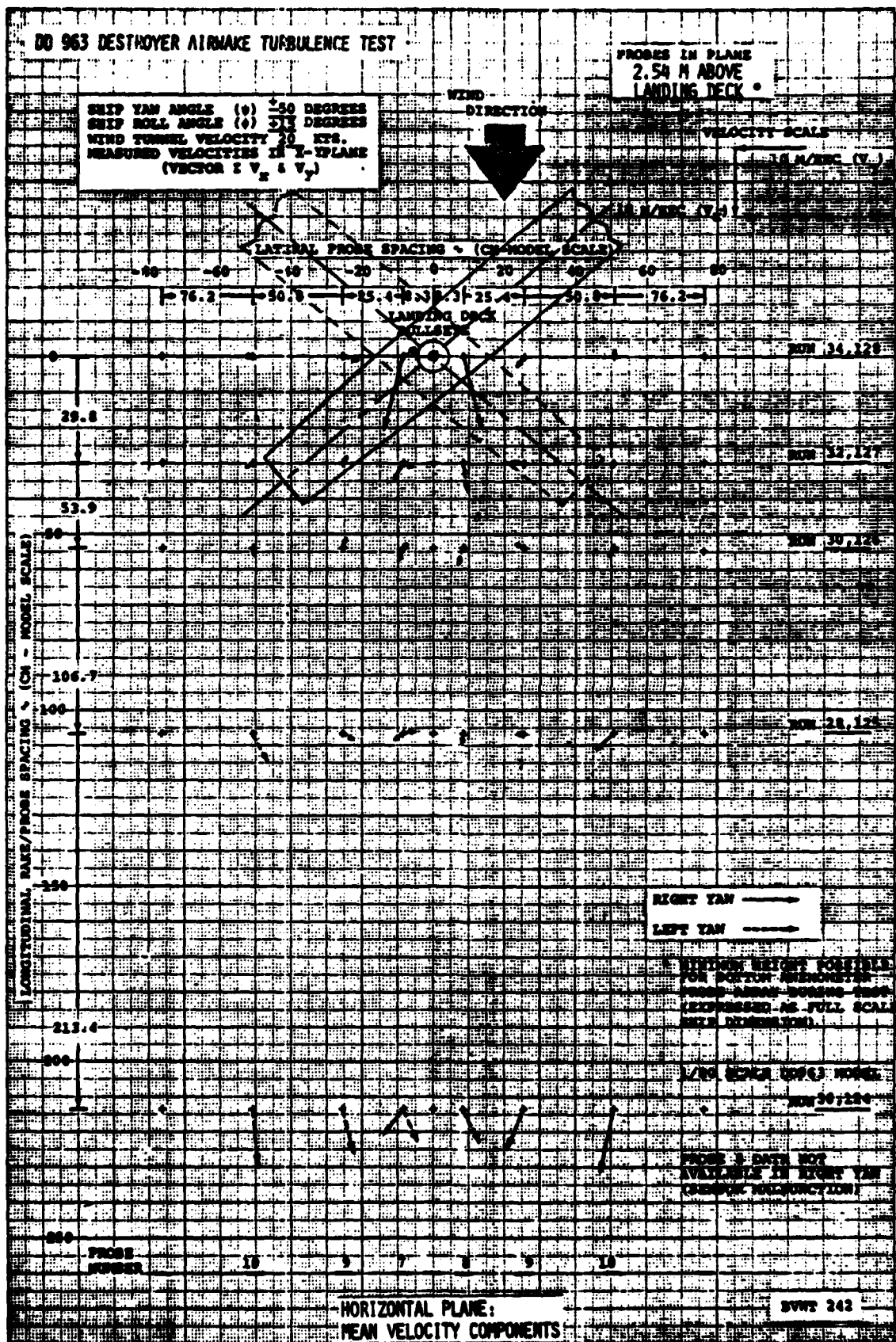


Figure C13.

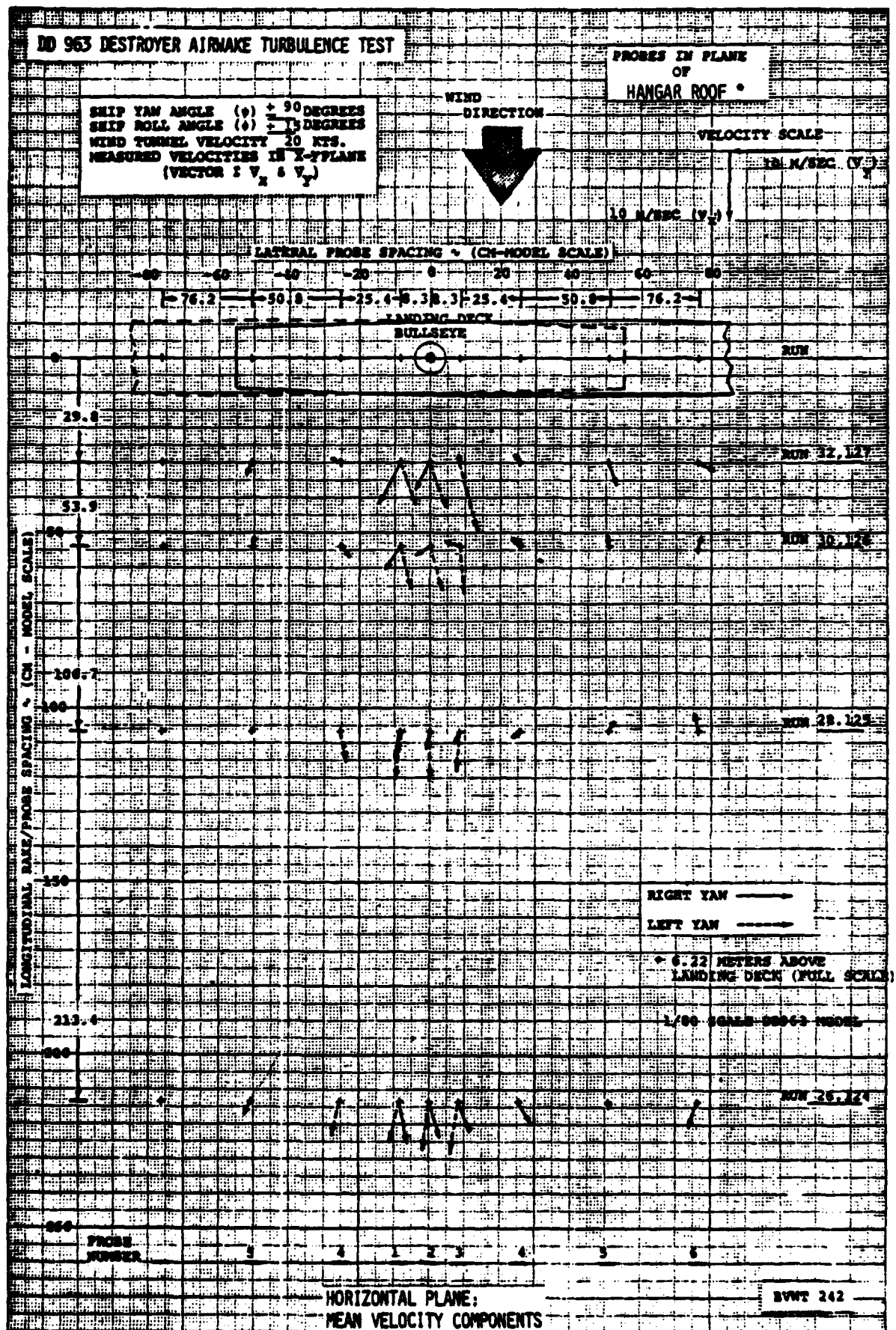


Figure C14.

Figure C-15 shows the flow field at the stack uptake height with the ship at  $0^\circ$  yaw and  $0^\circ$  roll angle, and at 45 knot remote wind velocity.

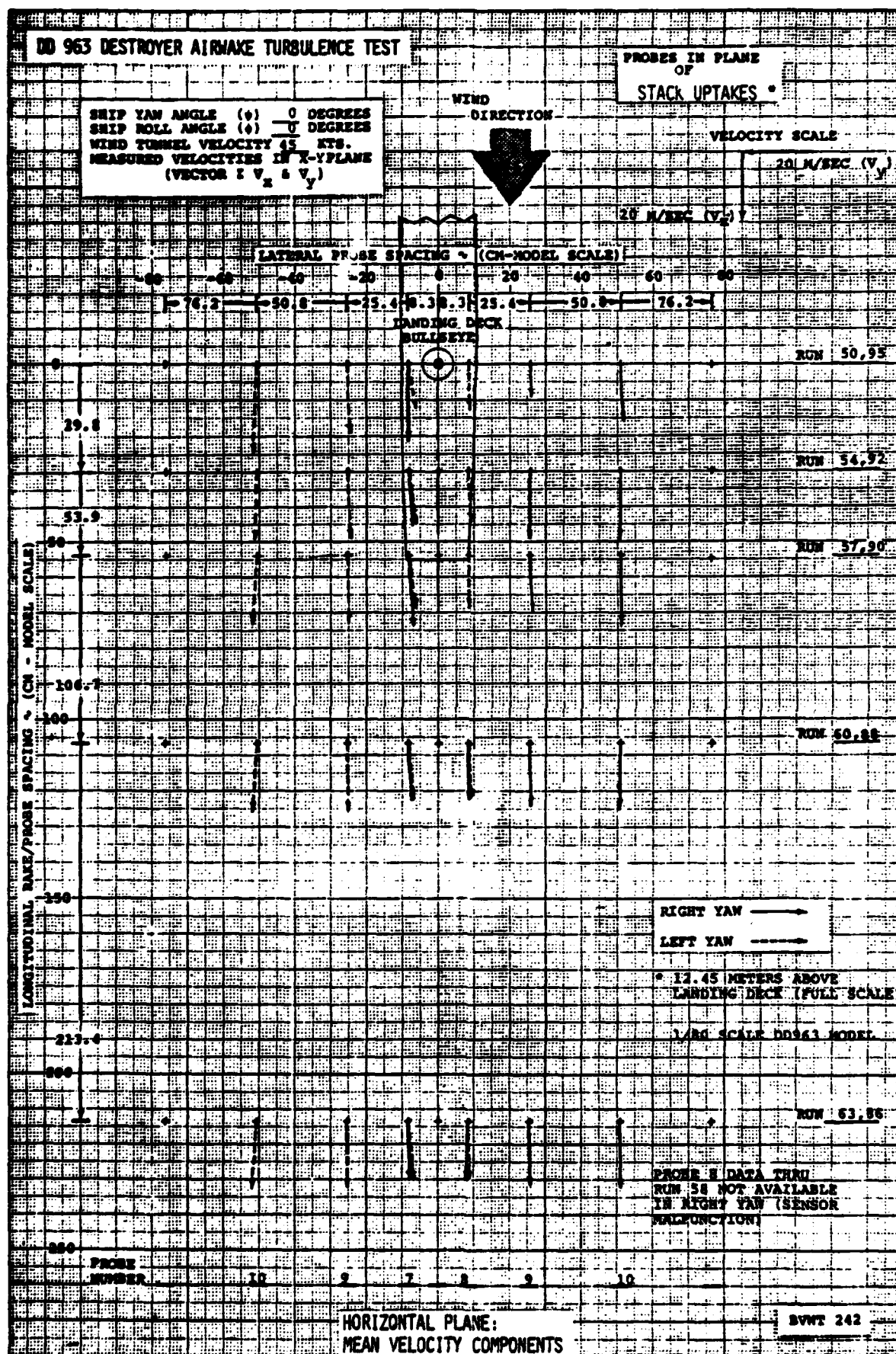


Figure C15.

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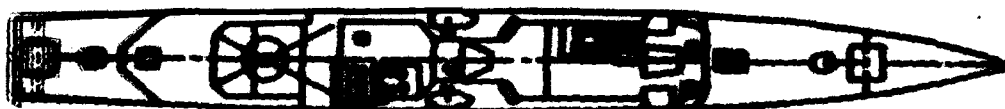
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